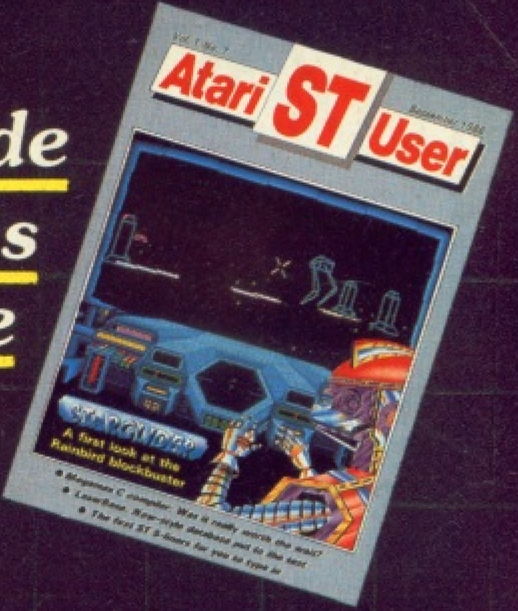
A Database Publication

ATARI USER

Vol. 2 No. 5 September 1986 £1

Inside this issue



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15 Software releases reviewed

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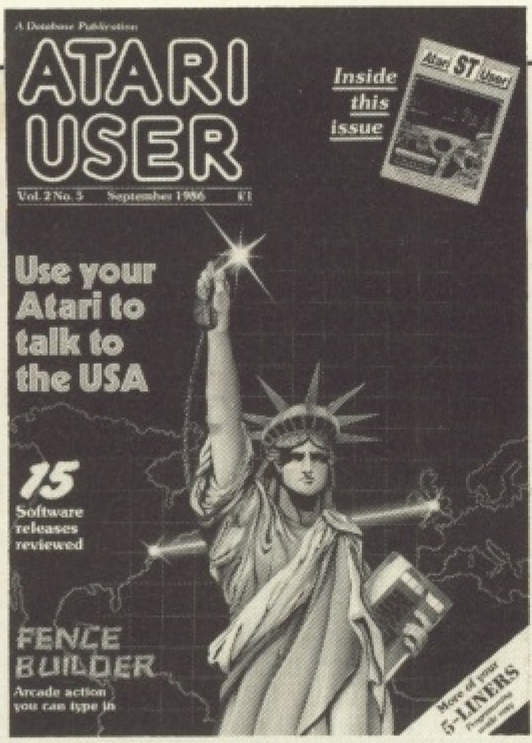
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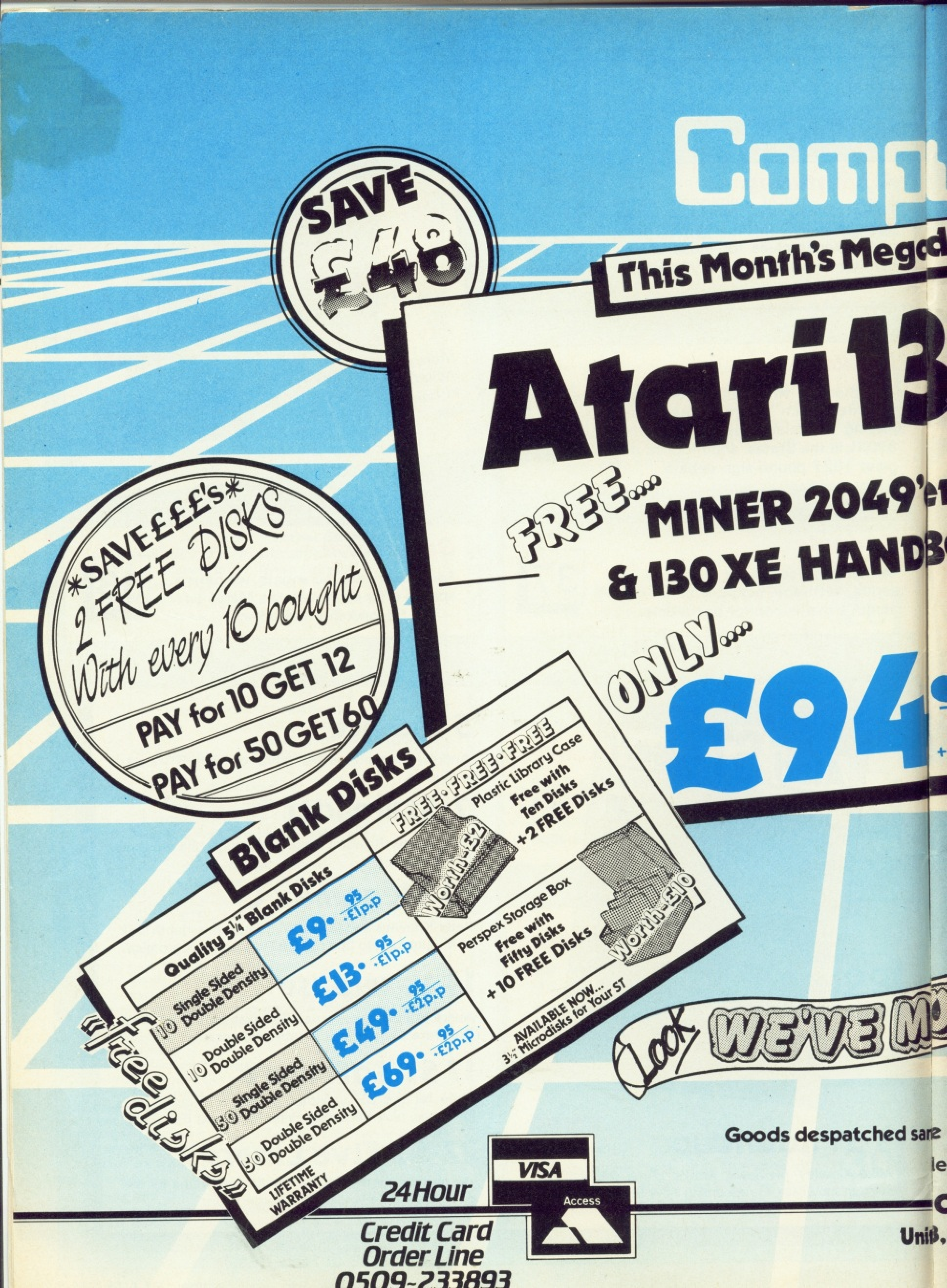
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Atari bids for UK schools market

BBC Basic emulator is the key

ATARI is set for a major breakthrough into the UK schools market this year.

The key to the new thrust is a Basic language emulator which makes the ST compatible with the massive software library of the BBC Micro, the UK's most popular educational machine.

Les Player, technical manager of Atari UK, says: "The emulator runs standard BBC Basic as fast as the Acorn machine itself.

"It has had an extensive workout at six test sites, including schools, by experts familar with BBC Basic.

"They were all very pleased with the software, which is 100 per cent compatible as a Basic interpreter and 95 to 97 per cent successful as a BBC operating system emulator".

Atari points out that the device isn't intended to replace the BBC Micro – the analogue port can't be emulated and the assembler is missing.

But there are hooks in it for 6502 compatibility which is promised at a later date, and a network filing system for Econet is also planned.

The arrival of the emulator is nicely timed to coincide with the start of a new school year and educationalists will get a chance to see it in action on the Atari stand at the PCW Show.

Atari bosses are confident it will significantly increase the ST's penetration of the education market, building on the machine's inroads into higher education.

"We know that many local education authorities are holding back on their purchases of new hardware until they see the BBC emulator", said Les Player.

"They have been impressed with the impact the ST has had in colleges and universities with its price and versatility".

Ron Harding, Atari UK marketing manager, said: "Almost all British universities have ST machines, some a large number of them, and we have sold to several LEAs.

"It has always been our intention to open up the machine to a wider range of software, and the emulator allows ST users to capitalise on another large spread of programs of particular value in the secondary education sector".

The emulator has a single unit price of £89.95, but there will be bulk discounts for educational purchasers.

The big show is coming

THE first ever Atari Computer Show, held at the Novotel, London, last March was an outstanding success, drawing a total of 15,000 visitors – 5,000 more than expected.

Observers said that this massive demonstration of popular support for the Atari range effectively re-established the company as a market leader in the UK computer industry.

This spectacular showcase returns to London on Friday, Saturday and Sunday, November 28 to 30, this time at the Royal Horticultural Hall, SW1.

Appropriately titled the Atari Christmas Show, the event promises to fulfil all the wishes of seasonal shoppers waiting to fill their stockings with the latest Atari hardware and software.

New programs and add-ons for the ST series and 8 bit range from both sides of the Atlantic will be launched at the show, and there will be opportunities to question the UK's leading experts in the field of Atari computers.

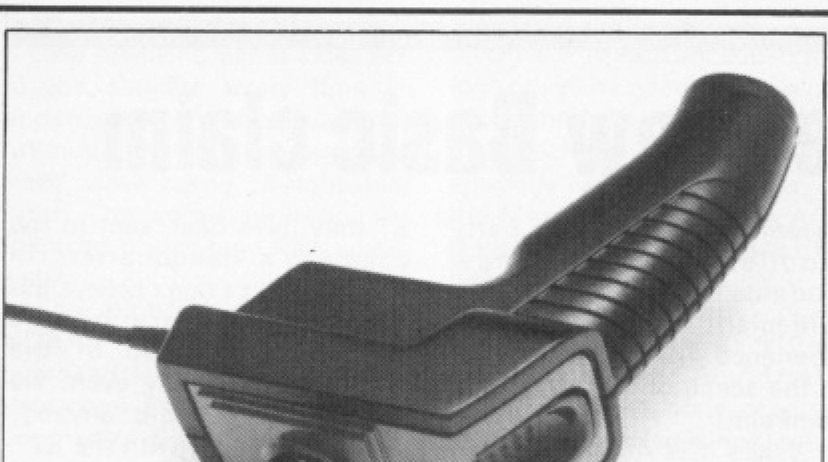
The show will be open from 10am to 6pm Friday and Saturday, 10am to 4pm Sunday, and there is £1 off tickets ordered in advance from organisers Database Exhibitions.

ATARI has begun shipping a product that will give the ST an even bigger share of the business market.

The 20mb hard disc drive will cost £848.70 and should be in full production this month, according to a company spokesman.

"It will be on display at the PCW Show and large quantities will be available within a few weeks", he told *Atari User*.

"We have already begun shipping a few units, and developers have had them to work with for some time".



ABANDONING conventional mechanical switching, Mastertronic has based its new joystick for the Atari range around micro-switches.

The Magnum is said to incorporate an innovation guaranteeing a tactile response to commands faster than other joysticks.

Available at the end of this month, the Magnum is expected to cost between £12 and £13.

Micro prize

ATARI software publisher Ariolasoft is running a competition with a 130XE as the prize.

Purchasers of Ariolasoft games get a Screen Shot Challenge card and have to use their skill to decide which game the illustration depicts.

If they get it right they can win a free game, an Ariolasoft badge, or money-off tokens. Even losers go into a draw for the top prize, an Atari 130XE.

Pascal compiler

PROFESSIONAL languages specialist Prospero Software has released its Pro Pascal language compiler for the Atari ST.

Turbo source code will port to the Atari with minor modifications and Pro Pascal also has full GEM AES and VDI bindings. Price: £129.

Adventure trilogy released

JEWELS of Darkness is the first of the Level 9 trilogies to be released by Rainbird Software for the Atari 800XL and ST.

Extensively re-written, the package comprises three of the most popular Level 9 adventures – Colossal Adventure, Adventure Quest and Dungeon Adventure.

In addition to a totally re-written parser, the package features a massive vocabulary and hundreds of added graphics with more than 500 colour illustrations and 600 locations.

Jewels of Darkness is available for the 800XL in a three cassette pack or on disc for £14.95 and on disc only for the ST priced £19.95. The package also contains a 64 page novella, The Darkness Rises, which contains a 12 page play guide.

MORE SMASH HITS

THE fifth volume in English Software's compilation series, Atari Smash Hits, has been released for the XL/XE range.

It features the best-selling Elektraglide plus Chop Suey, Mediator and Quasimodo, licensed from Synsoft-US Gold.

Twin cassette costs £9.95, twin disc £14.95.



Still trekking...

MARKING the 20th anniversary of the cult TV series Star Trek, Beyond Software has been appointed by Paramount to produce the first official arcade/strategy game based on the show and its famous characters.

The Atari ST version will be launched next month and coincide with BBC Television's re-running of the series.

Compact accounts

AN accounting program for the Atari ST which claims a unique compaction of data allowing 80,000 transactions on each double-sided disc has been released by Business Applications Software.

It has full double entry system with automatic VAT extraction, trial balance, trading account, profit and loss account, balance sheet and VAT return between any two dates.

Transactions can be entered in any order, automatically sorted by date, and there is automatic indexing of up to 2,000 accounts per disc. Price: £170.

Also new for the ST is BAS Database, a general purpose program providing unlimited expansion by allowing a database to be spread over as many discs as required. Price: £120.

A fully integrated combination of the above programs – BAS Business System – is also available at £290. It comes configured to handle stock control, invoicing, mailing lists, purchase orders and accounting ledgers.

Shanner deal

TOP American software distributor Shanner International has concluded a tie-up deal for its Atari ST products to be marketed exclusively in Europe by Robtek.

First Shanner product to be released by Robtek is the Real Time Clock cartridge, said to be the hottest selling ST item in the US.

Robtek products such as Atari DB Calc are being distributed in America, Canada and Asia by Shanner as part of the new deal.

Atari denies new Basic claim

REPORTS of a new Basic from Metacomco to replace the much criticised version bundled with the Atari ST are misleading, the company says.

Metacomco announced in a press release that it would be demonstrating a new Basic interpreter at the PCW Show and that it expected it to be bundled with the ST "in the very near future".

The announcement was welcomed by ST users critical of the Digital Research Basic bundled with the ST, which suffers from inaccurate floating point and unreliable I/O functions.

But Atari UK chief Max Bambridge told *Atari User:* "What Metacomco has said is not necessarily part of our corporate plans.

"We are very chary about statements from third party suppliers promising new products for our machines, particularly in view of past experience like the non-arrival on the scene of GemWrite and GemPaint.

"While it is Atari's intention to proliferate products for the ST – to which end we have made the machine as transparent as possible – we are extremely circumspect about claims for products when we have not had the finished version in our hands".

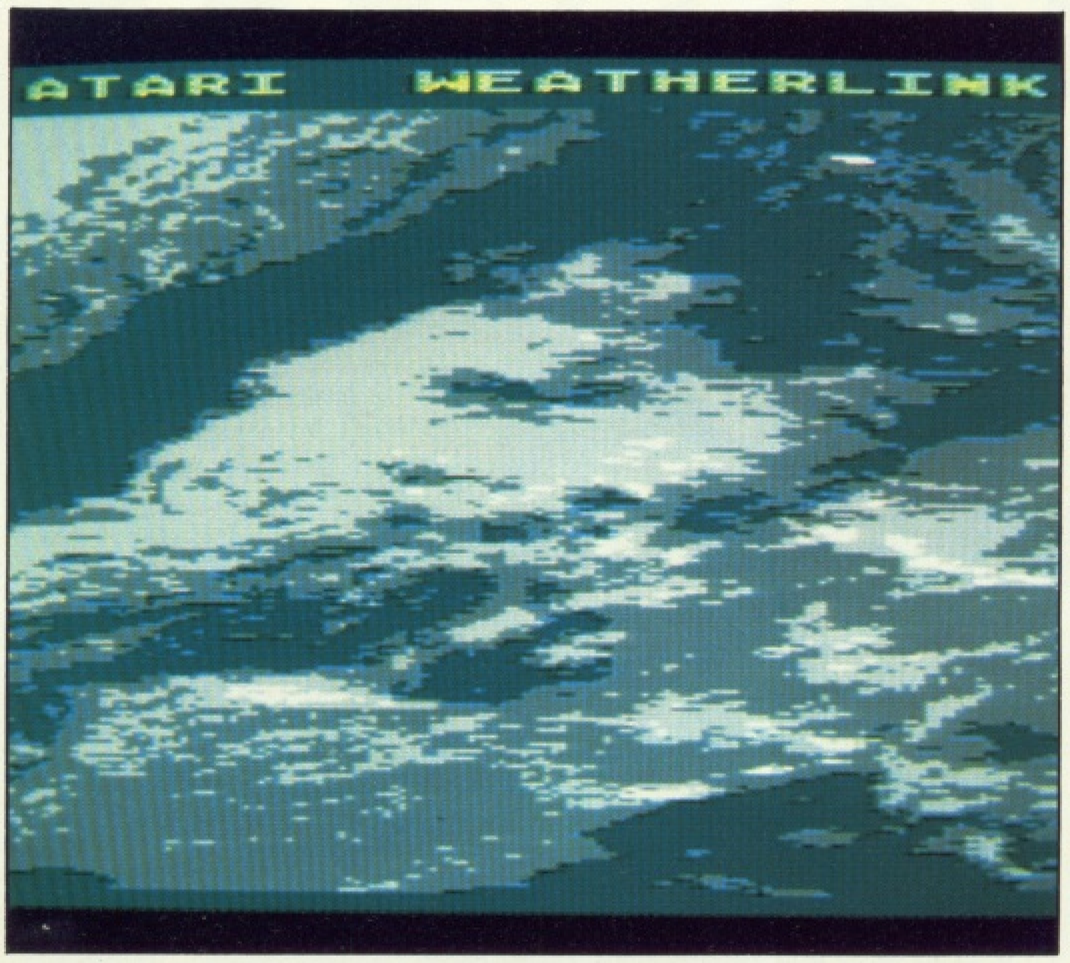
Metacomco product manager Andrew Spencer said his non-disclosure agreement with Atari prevented him from commenting further.

An Atari official confirmed that an evaluation copy of Metacomco Basic for the Atari ST may have been sent to the company's headquarters in America, "but I don't believe this can be anywhere near a completed version of the product, and in any event we haven't agreed with anybody about bundling it with the ST".

Books for ST series

NINE books about the Atari ST series have been published by Glentop. Written with support from Atari, they range from introductory books for the absolute beginner through to advanced works on programming techniques and professional business applications for the more specialist user.

Titles are Introducing the Atari ST, Using Basic on the Atari ST, Using Gem on the Atari ST, Using Databases with the Atari ST, Using Graphics on the Atari ST, Using Logo on the Atari ST, Practical Logo on the Atari ST, Advanced User's Guide to the Atari ST, and Business Applications with the Atari ST. With the exception of the Advanced User's Guide, which costs £12.95, they are all prices at £7.95.



Now Ataris tap weather maps

A SOFTWARE breakthrough means that all Atari 8 bit users can now see what Britain's weather looks like from outer space.

With their Atari they can tune into a weather satellite and receive the same information that enables the men from the Met Office to predict sunshine or showers.

All this is possible with WeatherLink, the exclusive service on MicroLink, the UK's national on-line database. It enables them to have an astronaut's view of weather patterns developing over the UK.

Using a monitoring station based in Kent, WeatherLink intercepts signals from the NOAA9 satellite and converts them into electronic data.

The receiving aerial locks on to the satellite every time it appears on the horizon and follows it until it disappears from view some 15 minutes later. The same sequence is followed on average four times a day.

Live pictures produced by NOAA9 hovering 450 miles overhead – it takes two at a time, one in visible light, the other infra red – clearly show that part of the world from North Africa, through Europe and Great Britain up to Iceland.

The pictures are recorded on computers at the tracking station. A converter then takes the image and readies it for transmission over standard telephone lines to the main MicroLink computer.

Once a MicroLink subscriber logs on, all he needs to do is pull down the information file.

To achieve this he requires specially written software on the MicroLink menu – the Atari 8 bit version of which has only just become available.

The new program comes courtesy of André Willey, technical editor of Atari User.

The machine code program to display the files is now ready for downloading from the system. In addition there is a convert routine to place the Expanded Ascii files into a form the Atari will understand.

Once both programs have been downloaded the user is ready to receive the latest pictures from outer space.

"The programs will work with any Atari 8-bit computer with a minimum of 48k", says André Willey. "So all you need is a modem and a MicroLink account to become your own weather forecaster".

ALL program listings in *Atari User* are now available for free downloading on MicroLink, the UK's fastest growing electronic mail service. They join hundreds of programs already available in the telesoftware section, one of the most popular areas of MicroLink.

In brief

NEW for the Ataris ST range is a video digitiser from Haba Systems.

It takes monochrome inputs from video cameras or VCR still frames, digitises them and stores the images on disc. Colour can then be added. Price: £249.50.

* * *

THE new ST Spell Checker from Frontier Software has a 30,000 word dictionary, is fully user-expandable, and operates in all resolutions.

It spell checks files from 1st Word, Final Word, Boffin, HabaWriter, ST Writer and most other ST word processors. Price: £19.95.

* * *

THE latest offering from CRL for the Atari 8 bit machines is a space adventure called Sunstar.

The player is required to pilot the supply ship Starfox on a mission to recover energy crystals vital to the world's survival, while avoiding destructive energy pulses which roam the planets.

Sunstar costs £9.95 on cassette and £14.95 on disc.

* * *

THE Terminal ST from Atari provides thorough emulation of the popular Dec VT100 and Tektronix 4010 terminal types, creating a versatile workstation at low cost.

Key features include bi-directional file transfer, user definable function keys, full GEM implementation, comprehensive Help facilities and slave printing options.

Price: £69.95.

* * *

FIRST of a range of business application programs being developed for the Atari ST by Kyle Data is the Kyle-Wages system. It was first written, in dBaseII, for CP/M machines three years ago, and has now been re-written to make use of the additional features of dBman, a dBaseIII look-alike.

The automatic payment section now runs more than three times faster than on the 8MHz CP/M86 machine, claims Kyle Data. Price: £200.

So you would like to write for Atari User ...

HERE at Atari User Towers we can always show visitors a huge pile of submissions which have arrived in the morning post. We are never surprised at the variety of your programs and articles.

For example, one day we'll get an article on computing in Poland and the next a program to draw 3D objects on the ST.

There are no hard and fast rules for submitting articles and programs to us. We always welcome material that you think might be of interest to fellow Atari owners.

To give you a better chance of having your programs and articles accepted we'd like you to bear in mind the following points before you submit your masterpieces.

- Everything you send to us must be labelled with your name, address and the program's or article's name. A daytime telephone number would also be helpful. Any work you submit must be your own and must not have been submitted to any other magazine.
- There is a gap for a few software reviewers for both the 8 and 16 bit computers. We are looking for quality writing rather than the ability to get telephone number high scores.

Reviewers must be able to turn out a 500 word review within a few days. In most cases you will be allowed to keep the software in addition to receiving payment at the standard editorial rates.

- If you have an interesting idea for an article, or a series of articles, you can always drop us a line to test it out before you put printer to paper.
- If you are submitting an article or review please print or type it double spaced – a blank line between each line of text – on one side of the paper.

Always use black print on white paper. Number each sheet and state the total number of sheets. For example, "Page 4 of 7". Also include a word count at the top of the first page.

- A number of you have told us in your letters that you've written some great games, but feel that they would be too long to publish. If you are in this situation, and don't know whether to submit your latest masterpiece, don't forget that we regularly publish longer listings in the form of special bonus items on the monthly disc and cassette releases.

This also applies to anyone who has written a long machine-code program which would otherwise be difficult to print.

- Always send in your programs *and articles* on tape or disc. A printed listing is helpful, but if we like the program we can always take the time to list it ourselves.

If you want your cassette or disc returned, please enclose an sae large enough to accommodate all of the material that you sent us.

- If the program is for the ST and is written in Basic or Logo send it on a disc along with the relevant language. If you send an 8 bit program on disc always make sure that it is in single density, and also contains the DOS files.
- Remember to include program instructions, and an explanation of your reasons for writing it if it is a utility. Also include a subroutine breakdown showing what happens in each part of the program.
- Include as many remarks within your programs as possible. This helps both us and the readers to understand its inner workings. Try to imagine that you are seeing it for the first time – which parts of the program are hardest to understand?

Never have a GOTO or GOSUB to a remark line, so that readers can safely leave out the remarks when they type your program into their machines.

- Get someone who has never seen your program before to test it. You'll be surprised how many bugs and mistakes will show up. Testing will also help you to write better instructions.

If you follow the above guidelines you'll not only have a much better chance of getting your work published, but you'll probably become a better programmer or writer into the bargain.

We look forward to seeing your work inside the covers of *Atari User* in the near future.

Andrew Bennett

Contributions should be sent to: Features Editor, Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.



What it offers the Atari user . . .

Electronic mail is much cheaper than the post

Sending mailbox messages to other subscribers, whose numbers are rapidly growing, is the cheapest form of communication possible. You can send a message of any length to another mailbox for less than the cost of a first-class stamp. And it doesn't cost a penny more to send the same message to 500 different mailboxes! Even a message sent to a mailbox on the other side of the world only costs 30p.

The biggest bulletin board of them all

The number of bulletin boards is growing rapidly. The only snag is that the vast majority are single-user boards – which means lots of other people are also trying to make contact and all too often all you get is the engaged tone. But with the MicroLink bulletin board there is no limit to the number of people using it at the same time. And no limit to the number of categories that can be displayed on the board.

Give your micro mainframe power

With MicroLink your micro becomes a terminal linked directly to the Telecom Gold mainframe computer, and able to tap its tremendous power and versatility. Right away you'll be able to use giant number-crunching programs that can only run on a mainframe.

The mailbox that is always open

MicroLink is in operation 24 hours a day, every day. That means you can access your mailbox whenever you want, and from wherever you are . . . home, office, airport – even a hotel bedroom or golf club! No-one needs to know where you are when you send your message.

We're only a local phone call away

The majority of MicroLink subscribers can connect to our mainframe computer in London by making a local phone call. This is possible because they use British Telecom's PSS system, which has access points all over Britain. A local phone call is all you need, too, for direct access via MicroLink to all the other countries belonging to the international Dialcom system.

Telemessages – at a third off

The modern equivalent of the telegram is the telemessage. Send it before 10pm and delivery is guaranteed by first post the following day (except Sunday). The service was intended for people phoning their message to the operator, which costs £3.50 for 50 words. But you can now use it via MicroLink, for only £1.25 for up to 350 words! For an extra 65p your message can be delivered in an attractive greetings card.

Go teleshopping on your micro

With MicroLink you can study the British Rail timetable – and then buy your ticket in advance. You can book theatre tickets. And even order a bouquet of flowers. It's all part of the teleshopping revolution!

Send and receive telex messages

With MicroLink you can turn your micro into a telex machine, and can send and receive telex messages of any length. You will be able to communicate directly to 96,000 telex subscribers in the UK, 1½ million worldwide – and even with ships at sea via the telex satellite network. Business people can now send and receive telexes after office hours, from home or when travelling.

What does it all cost?

Considering all the services you have on tap, MicroLink is remarkably inexpensive. You pay a once-only registration fee of £5, and then a standing charge of just £3 a month. On-line costs are 3.5p a minute (between 7pm and 8am) or 11p a minute during office hours. There is an additional 2.5p a minute PSS charge if you are calling from outside the 01- London call area. Charges for telex, telemessages and storage of files are given on the next page.

How much it costs to use MicroLink

Initial registration fee: £5.

Standing charge: £3 per calendar month or part.

Connect charge: 3.5p per minute or part – cheap rate; 11p per minute or part – standard rate.
Applicable for duration of connection to the Service. Minimum charge: 1 minute.
Cheap rate is from 7pm to 8am, Monday to Friday, all day Saturday and Sunday and public holidays; Standard rate is from 8am to 7pm, Monday to Friday, excluding public holidays.

Filing charge: 20p per unit of 2,048 characters per month.
Applicable for storage of information, such as telex, short codes and mail files. The number of units used is an average calculated by reference to a daily sample.

Telex registration: £10.

Outgoing telex: 5.5p per 100 characters (UK); 11p per 100 (Europe); 18p per 100 (N. America); £1.25 per 400 (Rest of world); £2.75 per 400 (Ships at sea).
Deferred messages sent on the night service are subject to a 10 per cent discount.

Incoming telex: No charge.

It is not possible to deliver a telex without a mailbox reference. If a telex is received without a mailbox reference the sender will be advised of non-delivery and asked to provide a mailbox address.
Each user validated for telex and using the facility will incur a charge of 6 storage units a month. Further storage charges could be incurred depending on the amount of telex storage and the use made of short code and message file facilities.

MicroLink PSS service: 2.5p per minute or part (300 baud); 3p per minute or part (1200/75 baud).
Only applies to users outside the 01-London call area.

Telemessages: £1.45 for up to 350 words.
Telemessages can be sent with an illustrated greetings card for 75p extra.

Radiopaging: No charge.
If you have a BT Radiopager you can be paged automatically whenever a message is waiting in your mailbox.

International Mail: For the first 2,048 characters – 20p to Germany and Denmark; 30p to USA, Australia, Canada, Singapore, Hong Kong and Israel. For additional 1,024 characters – 10p; 15p.

These charges relate to the transmission of information by the Dialcom service to other Dialcom services outside the UK and the Isle of Man. Multiple copies to addresses on the same system host incur only one transmission charge.

Billing and Payment: All charges quoted are exclusive of VAT. Currently all bills are rendered monthly.

Software over the telephone

MicroLink is setting up a central store of software programs which you'll be able to download directly into your micro. The range will include games, utilities, educational and business programs, and will cover all the most popular makes of micros.

Talk to the world – by satellite

MicroLink is part of the international Dialcom network. In the USA, Australia and a growing number of other countries there are many thousands of users with electronic mailboxes just like yours. You can contact them just as easily as you do users in Britain – the only difference is that the messages from your keyboard go speeding around the world via satellite.

What you need to access MicroLink

You must have three things in order to use MicroLink: a computer (it can be any make of micro, hand-held device or even an electronic typewriter provided it has communications facilities), a modem (it can be a simple Prestel type using 1200/75 baud, or a more sophisticated one operating at 300/300 or 1200/1200 baud), and appropriate communications software.

MicroLink
in association with TELECOM GOLD*
Application Form

I/We hereby apply to join MicroLink

(✓) □ I enclose my cheque for £5 payable to Database Publications as registration fee to MicroLink.

(✓) □ I also wish to use Telex. I authorise you to charge an additional £10 to my initial bill for validation.

☑ I confirm that I am over 18 years of age.

☑ I confirm that I accept the terms and conditions for the time being in force, a copy of which are available on request.

I intend to use the following computer ______

Signature ______

Date ______

FOR OFFICE USE ONLY:
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AT9

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Database Publications
Europa House
68 Chester Road
Hazel Grove
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Commencement of Service
Please indicate month of commencement ☐☐ 19 ☐☐
Allow 10 days for validation of mailbox

Payment
Whilst Database Publications Ltd is the supplier of all the services to you, the commission and billing thereof will be handled by Telecom Gold as agents for Database Publications Ltd.
Date of first payment to be on 15th of month following commencement.
Please complete billing authorisation form A, B or C below:

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I/We authorise you until further notice in writing to charge to my/our account with you on or immediately after 15th day of each month unspecified amounts which may be debited thereto at the instance of British Telecommunications plc – TELECOM GOLD by Direct Debit. Bills are issued 10 days before debit is processed.

Name of Account to be debited ______

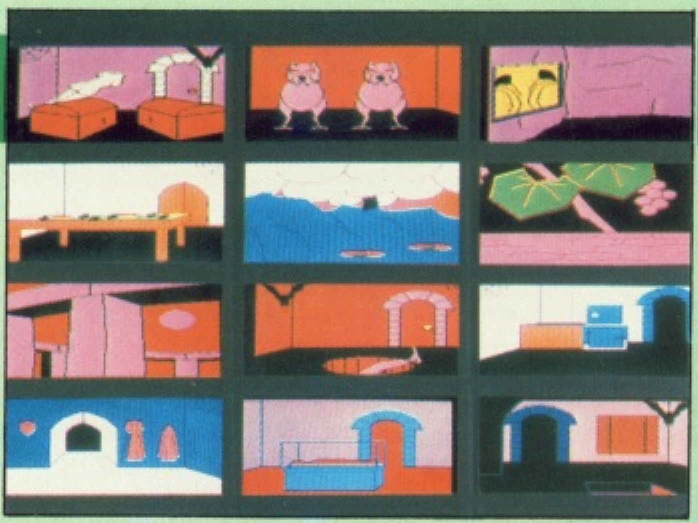
Account Number ______

(✓) □ **B. Please debit my/our Access/Visa/*American Express account number** ______
* *Overseas subscribers only*

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(✓) □ **C. Please invoice the company/authority.**
If you select this option, which is ONLY AVAILABLE to government establishments and Public Limited Companies, we will require an OFFICIAL ORDER to accept unspecified amounts.

Magikal moments



Program: The Price of Magik
Price: £9.95 (cassette)
Supplier: Level 9, PO Box 39, Weston-Super-Mare, Avon BS24 9UR. Tel: 0934 814450

THERE I was stripped almost to the buff, sticky and reeking from an over generous application of Ambre Solaire, and ready to be transformed into a sun-bronzed god. Then The Price of Magik arrived.

I should have resisted the temptation to load it up there and then. Such is the hypnotic power of the Austin clan's text and graphics adventures that once I had begun to play my chances of pulling away before sunset were negligible.

A sequel to Level 9's successful Red Moon, The Price of Magik is available for XL and XE systems and is Lenslok protected. Your aim is to defeat the sorcerer Mylgar who has gotten a little too big for his curly-toed carpet slippers.

There are no treasures to collect. The name of the game is magic – you must acquire and learn to use 18 spells.

At the start you know as much about magic as Frank Bruno knows about the mating rituals of yaks. But to win you must know everything – about spells, that is.

Each spell requires a certain object to focus through before it will work, so it is essential to find as many objects as you can.

Once you've discovered the name of a spell – they tend to be scattered around as inscriptions on scrolls, parchments and other less obvious items – it's easy enough to find out what object goes with it.

Just CAST VIM or whatever – if you haven't already got the appropriate object, the program will tell you which one you need.

However even when you've got the right object you've still got to work out what effect the spell has and when and where to best use it. Not so elementary, my dear Watson.

There's bags of locations to explore without fear of coming to a complete stop because of an obdurate puzzle.

There are plenty of objects too, and you could end up looking like an oversuccessful rag and bone merchant if you tote everything around with you.

I preferred to play with the illustrations – over 200 of them – turned off. They're attractive enough, but added little to my enjoyment and sometimes seemed to conflict with the textual description.

Among the many superb features are the sophisticated parser (I loved being able to examine all objects in one go), huge vocabulary, massive text, very fast entry and response, good combat system and character interaction.

Another thoroughbred from the level 9 stable. Long may it continue to produce them.

Bob Chappell

Sound	n/a
Graphics	8
Playability	10
Value for money	9
Overall	9

Ageing Rambo



Program: Shamus
Price: £2.99 (cassette)
Supplier: Americana Software, Units 2 & 3, Holford Way, Holford, Birmingham B6 7AX. Tel: 021-356 3388

IN the early days of the Atari certain games appeared that were to become legends – for example Star Raiders and Eastern Front.

Another superstar was Shamus, a fast and furious shoot 'em up. When it first appeared it cost about £30, but now it can be yours for just one tenth of the price.

In its day Shamus was superb, with fast moving graphics and vibrating multicolour walls. I must admit it looks rather crude compared to today's standards, but even now it has an appeal that most current games lack.

Shamus is an American term for a private eye, but in the game you are more of a Rambo character who shoots anything that moves.

You are the Shamus sent to hunt down and destroy the Shadow in his lair. The lair consists of a large building split into four levels of 32 rooms each.

Each level is inhabited by Robo Droids, whirling Drones and Snap Jumpers. These nasty friends of the Shadow have only one instruction in their memory banks – to wipe you out.

Armed only with Ion Shivs – Ionic Short High Intensity Vaporisors – you journey through the colour coded levels starting with black, ti easist, through blue and green to red, the most difficult.

Each level has four keys and four keyholes scattered at random about the complex. The keys are coded for each keyhole, so you must visit almost all the rooms.

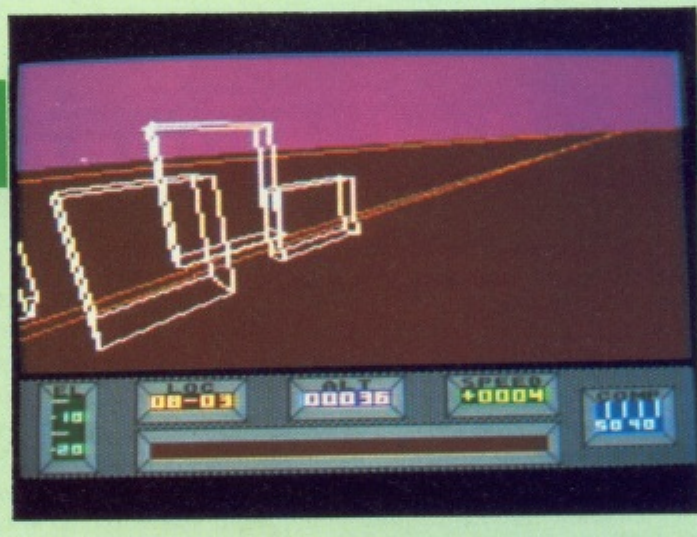
Moving over a keyhole causes one wall to disappear allowing you to progress deeper into the complex.

To the first time buyer, I would recommend this classic, but don't expect to be stunned by the graphics. What you will get is one of the most addictive games in a long time.

Paul Irvine

Sound	7
Graphics	6
Playability	9
Value for money	10
Overall	9

Nice one, Ollie



Program: Ollie's Follies
Price: £2.99
Supplier: Americana Software, Unit 2 & 3, Holford Way, Holford, Birmingham B6 7AX. Tel: 021-356 3388

OLLIE'S Follies is yet another platform game, but what it lacks in the novelty department it more than makes up for in the addiction stakes.

Like most games of this type, the object is to progress through a number of increasingly difficult screens. In this case there are 24 of them, so you can see that there's a good deal of play in the game.

Refraining from charging straight into the game has its rewards. While on the title page the program soon launches into a swift preview of all the screens, served up in several consecutive showings.

Ollie, a young lad clad in blue dungarees, can leap, turn and run to the left or right.

On each screen he must make his way over a series of platforms and ramps to an exit which leads to the next screen.

Although Ollie can drop short distances, if he falls too far he begins to spin head over heels and loses one of his five lives.

Some of the platforms are patrolled by revolving robots. If Ollie touches one he loses a life.

Dotted around the screen are some floating balls – these turn out to be energisers which, once touched, turn his hair a different hue.

The effect only lasts for about five seconds, but while it does – and a jingle burbles away to tell you – Ollie has the power to touch and destroy robots with impunity.

Screen 3 introduces large fans which cause him to get blown off the ramps if he's not sharp enough. He must also dive down a large tube at the bottom of which is a platform guarded by a wandering robot.

The screens get more and more difficult with added hazards and ever more cunning platform layouts.

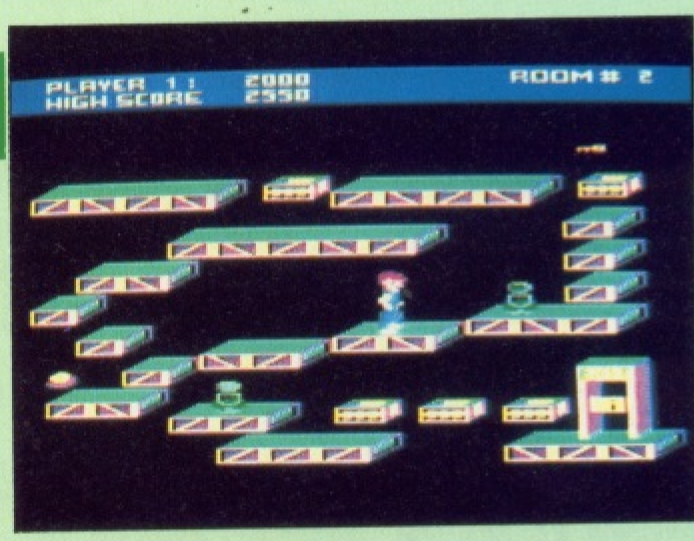
There are sliding ledges, robots, fans, teleporters, tightropes, springboards, bolts of lightning and laser walls.

Ollie's Follies is very enjoyable and likely to keep you coming back for more until you've cracked it. At the low price it's too good a bargain to miss.

Bob Chappell

Sound	7
Graphics	8
Playability	9
Value for money	9
Overall	9

Mercenary plus



Program: The Second City
Price: £5.95 (cassette), £9.95 (disc)
Supplier: Novagen, 142 Alcester Road, Birmingham B3 8HS. Tel: 021-449 9516

FANS of Paul "Encounter" Woakes' superb Mercenary: Escape from Targ will welcome this new release. The Second City is not a follow up, but an alternative data set for use with Mercenary.

Buyers take heed – The Second City is not a standalone program and will not run by itself.

Only Mercenary owners will be able to use it since it is designed to be loaded in only when Mercenary is resident in your Atari.

Once Mercenary is loaded and the opening sequence of the crash landing on Targ has been completed The Second City is installed by the usual restore-saved-game procedure.

Very briefly for those unfamiliar with it, Mercenary is a heady mix of flight simulation, strategy and arcade action using incredibly fast 3D vector graphics. You'll believe your Atari can fly when you see it.

In this alternative scenario the green landscape and blue skies of the tourist haven of Targ Central City have been replaced by the red earth and purple heavens of the wintry southern hemisphere.

At first sight things seem pretty familiar, but there is much that is not. The two rival races – Mechanoids and Palyars – are still here and still require the services of a skilled mercenary.

Commodity values have rocketed though. The Palyar Commander's brother-in-law has been seconded here as prison governor – I stole his ship at the beginning of the game and he was not best pleased.

Entering the city is via elevators as usual, but the rooms are even trickier. More than once I found myself in a prison with no visible means of escape – what are those two dots on one of the prison walls?

One room is pitch black and seems massive – it took a long time to find the way out.

There's plenty of objects lying around, but I didn't much like the result of picking up a skull and crossbones sign – still I can't say I wasn't warned.

What makes this game stand head and shoulders above all others involving flight sequences is the breathtaking speed of the vector graphics.

Swooping over, around, down and through a structure is simply joyous. This additional data set is worth buying for the chance it gives you to extend and vary an already classic game.

Douglas Wooller

Sound	7
Graphics	9
Playability	10
Value for money	9
Overall	9

Sovereign remedy



Program: Lapis Philosophorum
Price: £14.95 (disc)
Supplier: Ariolasoft, 68 Long Acre, Covent Garden, London WC2E 9JH. Tel: 01-836 3411

IF you have trouble with the unusual name of this text and graphics adventure let me help you out by mentioning the subtitle – the Philosopher's Stone. Sibilant stuff eh?

The plot concerns a kindly king who has remarried after the death of his first wife. The remarriage has given him an heir, a stepson who is a right nasty piece of work – funny how often there's a royal rotter in adventures.

He can't wait to get his grasping digits on the old orb and sceptre, so is poisoning the king.

Out to all the healers goes an SOS – save our sovereign – but unbeknown to kingy, the aforesaid rotter has bribed all the quacks to keep well clear.

As death begins to shout "Come in number 1 your time is up" in the king's ears, a single hope remains. Only you, a former alchemist who has long since hung up the pestle and mortar, can now save him.

The game opens with a nice little tune and impressive title screen – skull and dripping candle on an ancient tome.

However the rest of the graphics are only average – simple trees, streets and houses – you know the sort of thing.

Each of the 83 locations has a largish picture with text underneath. The descriptions are fairly brief and presented in gothic-type manuscript.

You start in your house – one room and a loft, no wonder you gave up alchemy – and must try to leave the walled and exit-guarded town.

Originating in Germany, the game appears to have been competently translated for the UK market.

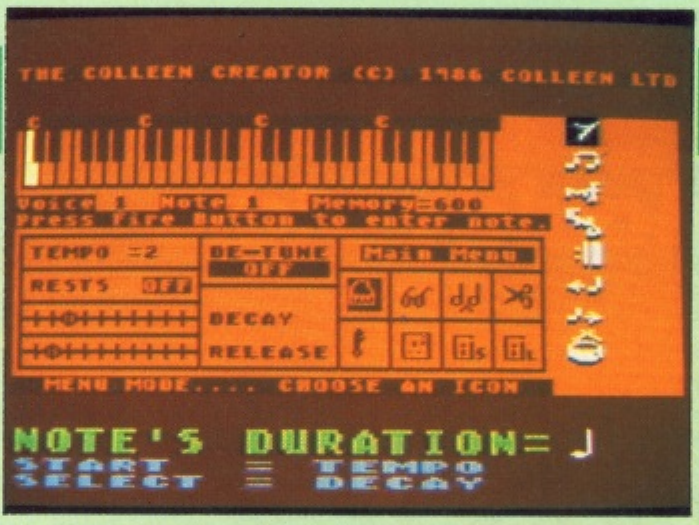
However the parser can only handle simple verb-noun commands and the vocabulary seems to have omitted some of the more usual and accepted words.

On the plus side the pictures are drawn very swiftly and there is an immediate response to input. Occasionally you're even given a hint when you ask for help.

Bob Chappell

Sound .... *n/a*
Graphics *6*
Playability *7*
Value for money *6*
Overall *6*

8 bits to the bar



Product: Colleen Music Compendium
Price: £29.95
Supplier: Colleen, 18 Bishop Street, Penygraig CF40 1PQ. Tel: 0443 434846

MUSIC Compendium is a collection of utility programs for writing and playing music on the 8 bit Atari.

Side one of the double sided disc contains the music creator, a compiler, as well as a drum machine and a sound effects generator.

Side two holds a two part music tutor, guitar tutor, playalong and a combiner program.

Compendium requires Basic, and boots-up automatically when the disc is in place and the Atari turned on.

The main screen is divided into two sections – the lower half shows the main menu console, containing eight rather obscure icons.

These are toggled by the joystick when it's not controlling the piano-style keyboard.

The software for writing music is reasonably straightforward once you've got the hang of it.

You simply move the joystick left or right along the keyboard and hit fire when you get to the right note.

It is then saved, its shape and duration changed by moving the same stick forwards or backwards.

A hair trigger arcade action type of stick would probably be more of a hindrance than a help in this situation. A keyboard option would have been useful.

A sight-reading friend of mine found the joystick controlled input rather slow and thought an option to shoot notes straight on to a stave with cross hairs might have been better.

Playalong is a fun piece of software that simply plays four types of music – disco, boogie, country and waltz.

The drum machine allows you to create several hours of semi-realistic drumming – the beat sequence is described in patterns, phrases and sections.

The compiler program combines up to four pieces of music into one long piece. You can write music in smaller sections, then combine them into one grand masterpiece.

Sound Effects Master provides you with some over used sound effects such as the Star Raiders hyperspace whoosh.

The music tutors show a series of lessons, with see-as-you-hear style education.

The guitar tutor shows all the major, minor and seventh positions on the screen, and also the correct fingering.

Colleen Music Compendium is a sophisticated music making utility, at a reasonable price.

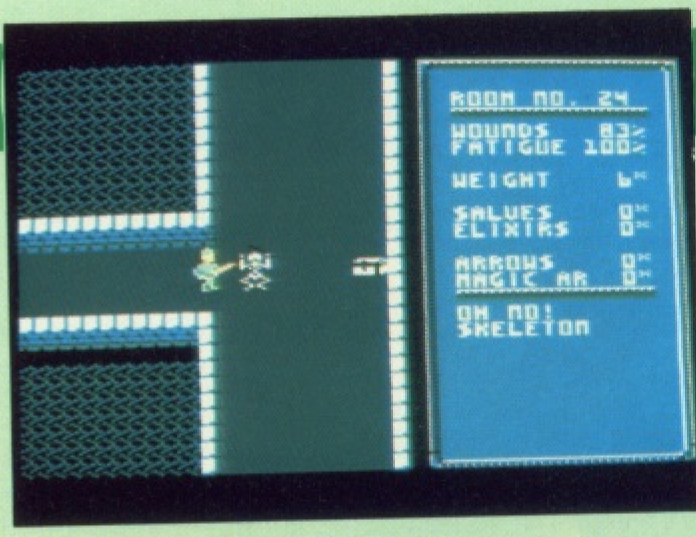
It does have a few design faults, but overall it is an impressive package – you certainly get a lot of code for your money.

Jason Kingsley

Sound *10*
Graphics *8*
Playability *7*
Value for money *8*
Overall *8*

Golden oldie

Program: Temple of Apshai Trilogy
Price: £14.95 (disc)
Supplier: US Gold, Units 2 & 3 Holford Way, Holford, Birmingham B6 7AX. Tel: 021-356 3388



I CAN remember with great pleasure playing Apshai on one of the original Commodore Pets so it shows how long in the tooth the series is – me too, for that matter.

Now these three games – Temple of Apshai, Upper Reaches of Apshai and Curse of Ra – have been updated, repackaged and issued by US Gold as a trilogy.

Apshai is a role-playing adventure in which you wander through labyrinths of tunnels and chambers battling monsters and gathering treasure.

The games are very similar to each other, differing only in labyrinth layout and contents.

The screen is divided into two windows. In the right hand window a variety of data is displayed including room number, wounds sustained, fatigue level and weight carried.

It also provides the quantity of healing salves, elixirs and arrows in your possession, the name of the monster you are fighting, battle reports and other messages.

The left hand window gives a graphically simple map of the passageways and chambers in the immediate vicinity. You are represented as a small animated figure which from time to time is accosted by various animated monsters.

There are 20 single-key commands at your disposal. You can move your character various distances, turn 90 degrees to the left or right, and turn about face or rest.

In a fight you can attack, parry, thrust, and fire a normal or magical arrow.

You can also search for traps, examine a wall for a secret door, open a door, pick-up or drop a treasure, listen for or speak to a monster, apply a salve or drink an elixir and list your treasures.

Accompanying the package is a quick-reference card and a superbly presented 80 page book which describes every room, monster, trap and treasure in full detail.

It also provides a wealth of background lore and useful gameplay information.

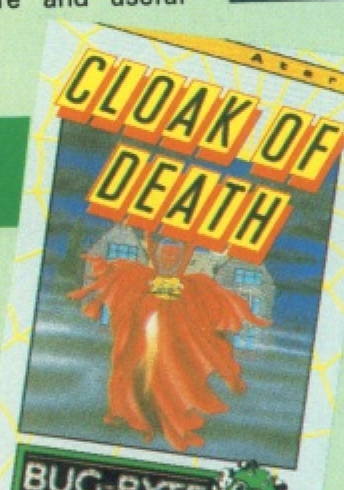
Apshai was the best of its kind in its heyday. Although it now seems simple stuff, being mostly monster bashing, it is still a pretty fair role-playing game and, at the price, a bargain.

Douglas Wooller

Sound	***4***
Graphics	***6***
Playability	***8***
Value for money	***8***
Overall	***8***

Mouldy oldie

Program: Cloak of Death
Price: £2.99 (cassette)
Supplier: Bug Byte, Liberty House, 222 Regent Street, London WIR 7DB. Tel: 01-439 0666



CLOAK of Death was first released about two years ago by Argus. I wish I could say it was worth re-releasing, but I'm afraid the game's more of a mouldy oldie than a golden oldie.

To give you some idea of its pedigree you have to load and run the game with CLOAD and RUN from Basic – now when did you last have to do that with a commercial game?

At the start you find yourself in a dark hall in an old house which is reputed to be haunted.

The front door has slammed behind you and there appears to be no way out. You must stay alive long enough to find the exit.

Each location is described using both text and an accompanying picture – the graphics can be turned off though.

The cassette inlay proudly proclaims that Cloak of Death is a spine chilling adventure with state of the art, blood curdling graphics.

However the truth is that this is a sub-average adventure with sparse textual descriptions and mediocre graphics.

It has more than its fair share of inconsistencies and illogicalities. In a sitting room the text told me that I could see a grandfather clock – but there was no sign of it in the picture.

Looking into a sink I was told there was some water there. When I tried to DRINK WATER the program didn't understand me.

Further examples: Examining a door revealed that "The latch is broken". My attempt to LIFT LATCH was countered with "I don't recognise that noun".

Dropping a wicker chair, standing on it then typing LOOK revealed items that anyone would expect to see even if they weren't standing on a chair.

But pride of place must go to the library where there were shelves full of books – how surprising. Trying to take or read a book got me nowhere but when I typed EXAMINE SHELF I was told "I see something!"

Typing LOOK revealed a book. I was allowed to take it, but only that one. Perhaps the rest were glued to the shelves.

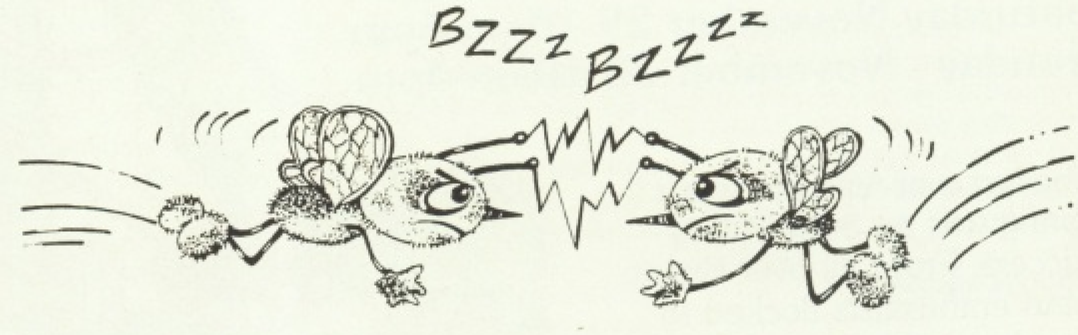
Taking a cue from the program I switched off Cloak of Death and went off to read a good book.

Bob Chappell

Sound	***n/a***
Graphics	***4***
Playability	***5***
Value for money	***4***
Overall	***4***

Get shape priorities right – and look to collision detection

Part V of STEPHEN WILLIAMSON's series on player missile graphics



THIS month let's look at collision detection, shape priority, overlap and size. Program I displays a wing-flapping bug, a tree and a purple man standing on the tree. Figure I is a list of the players and playfields used to make up these shapes.

The bug can be moved via the joystick. It moves fairly slowly because of the amount of processing taking place after each move, but for the purposes of this demonstration speed is not important.

If the bug – Player 3 – touches any of the playfields (other than Playfield 0) or another player, a collision has taken place and the collision display at the bottom of the screen will change according to the type of collision that has occurred.

Figure II is a list of the collision detection registers and the values found in them when a collision takes place. They may be familiar to you, for registers 53248 to 53255 are also used as horizontal registers.

When you poke a number to the horizontal registers, Antic snatches that number away from the register and uses it to alter the horizontal position of the player or missile stripe.

Because of this, when we are using addresses 53248 to 53256 as horizontal registers they are called write-only registers. Information can be stored in them, but not retrieved.

When a collision occurs, Antic passes the collision code into the collision register, and this can be read using a PEEK statement. Thus when addresses 53248 to 53255 are used as collision registers they are read-only addresses.

To see how collision detection works, move the bug (Player 3) over to the tree trunk (Playfield 1), and the playfield collision number will change to 1 which, from Figure II, can be seen to represent a collision between Player 3 and Playfield 1.

Now stop the program by means of

Player 0	Green top portion of tree.
Player 1	Unused.
Player 2	Purple man.
Player 3	Bug.
Playfield 1	Tree trunk.
Playfield 2	Yellow line around edge of graphics screen.
Playfield 3	Unused.

Figure I: Players and Playfields used in Program I

```
10 REM  PLAYER ANIMATION
20 REM  by Stephen Wiilamson
30 REM  FOR ATARI USER
40 REM  PROGRAM I - PART 5
50 GRAPHICS 5:POKE 559,0:POKE 755,0
60 SETCOLOR 2,0,0
70 PMB=PEEK(106)-16
80 POKE 54279,PMB
90 PMBASE=PMB*256
100 FOR J=0 TO 41:READ A:POKE 1623+J,A
:NEXT J
110 A=USR(1623,PMBASE,2048)
120 FOR J=0 TO 86:READ A:POKE 1536+J,A
:NEXT J
130 FOR J=0 TO 25:READ A:POKE PMBASE+J
,A:NEXT J
140 FOR J=0 TO 10:READ A:POKE PMBASE+1
536+104+J,A:NEXT J
150 FOR J=0 TO 19:READ A:POKE PMBASE+1
024+115+J,A:NEXT J
160 POKE 559,62
170 POKE 623,1
180 POKE 704,198:POKE 706,88:POKE 707,
204
190 POKE 53248,100:POKE 53250,118
200 POKE 53251,140
210 POKE 712,34
220 POKE 53277,3
230 POKE 53256,3:POKE 53258,1
240 COLOR 2:PLOT 0,0:DRAWTO 79,0
250 DRAWTO 79,39:DRAWTO 0,39
260 DRAWTO 0,0
270 COLOR 1:PLOT 32,26:DRAWTO 32,39
280 PLOT 33,26:DRAWTO 33,39
290 PLOT 34,26:DRAWTO 34,39:PLOT 35,26
:DRAWTO 35,39
300 HORIZ=130:VERT=140
310 S=STICK(0):RESTORE
320 IF S=11 THEN HORIZ=HORIZ-1
330 IF S=7 THEN HORIZ=HORIZ+1
340 IF HORIZ<48 THEN HORIZ=48
350 IF HORIZ>202 THEN HORIZ=202
360 POKE 53251,HORIZ
370 IF S=13 THEN VERT=VERT+1
380 IF S=14 THEN VERT=VERT-1
390 IF VERT<32 THEN VERT=32
400 IF VERT>212 THEN VERT=212
410 A=USR(1536,PMBASE,PMBASE+1792+VERT
,13)
420 A=USR(1536,PMBASE+13,PMBASE+1792+V
ERT,13)
430 KEY=PEEK(764):PK=PEEK(623)
440 IF KEY=8 AND PK>32 THEN PK=PK-32:K
EY=0
450 IF KEY=8 AND PK<32 THEN PK=PK+32:K
EY=0
460 IF KEY=10 AND PK=33 OR KEY=10 AND
PK=1 THEN PK=PK+1:KEY=0
470 IF KEY=10 AND PK=34 OR KEY=10 AND
PK=2 THEN PK=PK-1:KEY=0
480 POKE 764,255:POKE 623,PK
490 PLAYCOLL=PEEK(53263)
```

Program I

the Break key and type in:

POKE 53255,200
:PRINT PEEK (53255)

POKE 53255,200 means that the horizontal position of Missile 3 has been altered. If a Missile 3 shape was displayed it would have moved to the right of the screen. Antic has now removed the value 200 from register 53255 and replaced it with the last collision value, which is still 1.

Line 490 looks at the value held in the Player 3 to player collision register (53263) and stores this value in the variable *PLAYCOLL*. Line 500 performs a similar operation for the Player 3 to playfield collision register (53255) which is stored in the variable *FIELDCOLL*.

Lines 520 to 530 display the current value of *FIELDCOLL* and *PLAYCOLL* to indicate if a collision has occurred, and what type of collision it was.

Run the program and move the bug until it touches the yellow line at the bottom of the screen. The value held in the Player 3 to playfield collision register (53255) is now 2, which means that Player 3 has collided with Playfield 2.

Now move the bug along the yellow line until it touches both the line and the tree trunk and the collision value of the playfield collision is now 3. The bug is touching Playfield 2 (the line) as well as Playfield 1 (the tree trunk). The collision register adds together the two collisions, codes 1 and 2, which give the collision code 3. In a similar fashion, if a player touches both Playfield 2 and Playfield 3 then, adding the values from Figure II, we get 6.

Register	Description	Values
53248	Missile 0 to Playfield	0=collision with Playfield 0
53249	Missile 1 to Playfield	1=collision with Playfield 1
53250	Missile 2 to Playfield	2=collision with Playfield 2
53251	Missile 3 to Playfield	4=collision with Playfield 3
53252	Player 0 to Playfield	
53253	Player 1 to Playfield	
53254	Player 2 to Playfield	
53255	Player 3 to Playfield	
53256	Missile 0 to Player	1=collision with Player 0
53257	Missile 1 to Player	2=collision with Player 1
53258	Missile 2 to Player	4=collision with Player 2
53259	Missile 3 to Player	8=collision with Player 3
53260	Player 0 to Player	
53261	Player 1 to Player	
53262	Player 2 to Player	
53263	Player 3 to Player	
53278	Clears all collision registers when 0 stored in this register.	

Figure II: Collision registers

If you move the bug up until it touches both the top of the tree and the man, a similar situation takes place. Collision number 5 represents the value held in register 53263 (Player 3 to player), which is a combination of collision between Player 2 (a value of 4) and Player 0 (a value of 1).

You could at this point stop the program by means of the Break key and type in:

PRINT PEEK (53262)

What value do you think you will get? Well, from Figure II we see that the collision register for Player 2 (the man) is 53262, and a collision between a Player 2 shape and a Player 3 (the bug) shape is 8.

After a collision its value stays in the collision register until the registers are cleared by using the command POKE 53278,0.

You cannot re-set individual registers, so line 540 clears both the player and the playfield collision registers. Because of this if you are using a program that contains several players and missiles, keeping track of collisions can be tricky. You must make sure that the collision registers

→

```
500 FIELDCOLL=PEEK(53255)
510 ? "CONTENTS OF ADDRESS 623      ←←←
";PEEK(623)
520 ? "PLAYFIELD COLLISION NO.   ←←←";
FIELDCOLL
530 ? "PLAYER COLLISION NO.    ←←←";PLA
YCOLL;"↑↑↑"
540 POKE 53278,0
550 GOTO 310
560 REM ** M/C CLEAR ROUTINE**
570 DATA 104,104,133,204,104,133,203,1
04,133,206,104
580 DATA 133,205,166,206,160,0,169,0,1
45,203,136
590 DATA 208,251,230,204,202,48,6,208,
244,164
600 DATA 205,208,240,198,204,160,0,145
,203,96
610 REM *** M/C VERTICAL ROUTINE **
620 DATA 104,201,3,208,81,104,133,225,
104,133,224,104,133,227,104,133,226,10
4,133,229
630 DATA 104,133,228,169,0,133,230,133
,231,168,177,224,145,226,24,169,1,101
640 DATA 224,133,224,169,0,101,225,133
,225,24,169,1,101,226,133,226,169,0,10
1,227,133,227,24
650 DATA 169,1,101,230,133,230,169,0,1
01,231,133,231,24,165,228,197,230,208,
206,165
660 DATA 229,197,231,208,200,96
670 REM *** SHAPE DATA ***
680 DATA 0,40,146,214,254,238,254,238,
186,170,56,16,0
690 DATA 0,40,16,16,56,40,56,40,56,40,
56,16,0
700 DATA 24,36,24,90,126,60,24,24,24,3
6,102
710 DATA 24,60,60,44,126,90,118,237,25
1,175,251,62,118,110,126,52,60,44,60,2
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	12877	20	14842	30	12666
40	12657	50	5988	60	2730
70	2770	80	2866	90	2903
100	7508	110	4240	120	7544
130	8183	140	9414	150	9440
160	1973	170	1837	180	6510
190	5163	200	2562	210	1938
220	2136	230	4389	240	5340
250	4794	260	1907	270	5766
280	4291	290	8568	300	3601
310	3983	320	5205	330	5086
340	5016	350	5207	360	3162
370	4854	380	4865	390	4570
400	4808	410	7404	420	7583
430	4764	440	6911	450	6905
460	10189	470	10200	480	4566
490	3929	500	4148	510	7638
520	7935	530	8087	540	2128
550	1615	560	4920	570	7331
580	6874	590	6307	600	6328
610	5817	620	12129	630	10715
640	13216	650	12068	660	4275
670	3666	680	7676	690	6298
700	6118	710	11081		

are only cleared after all of your tests are complete.

The second thing Program I demonstrates is shape priority.

Move the bug until it is part way over the tree trunk, then press the P key to change the shape priority. Part of the bug will now be obscured by the tree.

Memory location 623 alters the priority and, as can be seen by the text display, now holds the value 2.

Figure III is a list of the priority options. As you can see, a 1 means players have priority over playfields, which means that players will appear to be in front of playfields. Option 2, which is instigated when you press the P key, gives playfields priority over Players 2 and 3. Because the bug is Player 3, the tree trunk (Playfield 1) appears on top of it.

If you move the bug directly underneath the tree so that when option 2 is chosen the bug is not visible, you will notice that the playfield collision register still detects a collision between Player 3 (the bug) and Playfield 1 (the tree trunk). So, even if you cannot see the actual collision, the program can still detect it. When writing programs that include both shape priority and collision detection, you must allow for this phenomenon.

If you study Figure III you will notice there are some restrictions to shape priority. You can only choose one set of priorities – 1, 2, 4 or 8 – which may not always conform to what you want to achieve in a program. You cannot, for instance, give Player 3 priority over Player 0. If you move the bug to the green

Register	Player
53256	0
53257	1
53258	2
53259	3

Poke these registers with 0 for normal size, 1 for double size of 3 for quadruple size.

Figure IV: Player size registers

section of the tree, (Player 0) it will always appear underneath it.

Because of these restrictions it is important to choose carefully which shapes you allocate to which players in order to achieve the correct effect.

Another option associated with address 623 is value 32, which is known as *overlap*. Move the bug underneath the man then press the O key and you will see a third colour (white) appear on areas where the two, players overlap. This only works for Player 0 in conjunction with Player 1, and for Player 2 with Player 3. You will not get a third colour when, for example, Player 1 is over Player 3.

You cannot choose which colour you get during the overlap option – try altering the colour registers of Player 2 and Player 3 in line 180 to see what other third colours appear during the overlap option.

You will observe from the contents of address 623 that if you want more than one option these are added together. Thus if you have a shape priority option 1, together with the overlap option 32, the contents of 623 should be 33 (32 plus 1).

Registers 53256 to 53260 are the size registers (as well as being read only collision registers) – see Figure IV. There are three sizes to choose from – normal, double and quadruple. If the size registers are not altered the players or missiles will default to normal size.

The size option alters the *width* of each individual pixel. Vertical size can only be altered by plotting more pixels within the player stripe, or by using the double resolution option.

In line 230 of Program I, Player 0 has been set to quadruple size by means of the command POKE 53256,3 and Player 2 changed to double size. Try altering these values to see how this affects the program.

Program I also introduces a short machine code routine that clears the player missile data area. In previous programs in this series this has been done from Basic by creating a FOR ... NEXT loop that pokes zeroes into the Player data area.

This is fine when dealing with just one player, as the time taken to clear 256 bytes is not very long, but if you are using a program that uses more players and missiles there is quite a wait while the program clears the whole data area.

The machine code routine cuts this delay by rapidly putting zeroes into the player missile data area. It is an adaptable routine that can be used to put a specified number of zeroes into a specified memory area.

The data for the routine is contained in lines 570 to 600. The formula for calling the routine up is:

A= USR(Address of MC routine, Address of area to be cleared, how many bytes to clear)

In line 110 the machine code clear routine is accessed using the above formula.

Program II is an example of using double resolution players. The procedure used is similar to that in Program I, except that the shape data is loaded into a different part of the player missile data area. (Player 0 from PMBASE+512, Player 1 from PMBASE+640, Player 2 from PMBASE+768, Player 3 from PMBASE+1024. See player data area memory map in Part 3).

The loading of the shape data into the correct player data area is taken care of by lines 130 and 140. In line

Priority options	Value
Players 0-3, Playfields 0-3, background	+1
Players 0-1, Playfields 0-3, Players 2-3, background	+2
Playfields 0-3, Players 0-3, background	+4
Playfields 0-1, Players 0-3, Playfields 2-3, background	+8
Other options	
All missiles to have same colour *	+16
Overlap of players to have third colour	+32

** The colour wil be the same as value stored in colour register 711 (Playfield 3).*

Figure III: Address 623 priority selection and overlap

150, location 559 is poked with 46 and not 62 as was the case with Program I. This removes the single resolution option so that the system defaults to double resolution.

You can "fine tune" the vertical position of any player or missile by altering register 53276 before each re-plotting sequence. This results in the players and missiles moving up or down in steps equivalent to a single resolution pixel height. The numbers to poke are given in Figure V.

Player 3	128
Player 2	64
Player 1	32
Player 0	16
Missile 3	8
Missile 2	4
Missile 1	2
Missile 0	1

Figure V

To see this at work, stop the program when the players are displayed and enter **POKE 53276,128** and watch the bug.

Program II also introduces us to the missiles. Control of the missiles' size is not as straightforward as that of the players. There are, like players, three missile sizes to choose from – normal, double and quadruple – but the only missile size register is located at address 53260.

Missile No.	Normal	Double	Quadruple
0	0	1	3
1	0	4	12
2	0	16	48
3	0	64	192

Add combination of missile sizes and poke this value into 53260 (missile size register).

Figure VI: Missile size (53260)

To work out what number to poke to this register, consult Figure VI and add up the options you require. For example, if you want a normal size Missile 0, double size Missile 1 and quadruple Missile 3 you would use **POKE 53260,196** (0+4+192=196).

Line 260 of Program II sets all missiles to quadruple size with the command **POKE 53260,255.** This means that the pixels that make up the missile shapes will be considerably larger than we have previously encountered when using normal size players.

Lines 210 to 230 set the horizontal positions of the missiles – remember missile horizontal registers are at 53252 to 53255.

Plotting the missiles can be complex. The way the data is organised within the missile data area is shown in the bit-mapped method first encountered in Part 2 of this series. Each missile stripe is only two pixels wide, and each byte controls all four missiles. The program shows how this works. When prompted you can enter any value between 0 and 255. This value is then given the variable name PO (line 320) which is then POKEd into the missile data area to switch on or off the appropriate missile pixels.

Line 3330 performs this function by POKEing PO into the missile data area (PMBASE+384+40).

The missile data area for double

```
10 REM  PLAYER ANIMATION
20 REM  by Stephen Williamson
30 REM  FOR ATARI USER
40 REM  DBL.PLAYERS & MISSILES
50 REM  PROGRAM II - PART 5
60 GRAPHICS 0:POKE 559,0
70 SETCOLOR 2,0,0
80 PMB=PEEK(106)-8
90 POKE 54279,PMB
100 PMBASE=PMB*256
110 FOR J=0 TO 41:READ A:POKE 1623+J,A
:NEXT J
120 A=USR(1623,PMBASE,1024)
130 FOR J=0 TO 12:READ A:POKE PMBASE+8
96+80+J,A:NEXT J
140 FOR J=0 TO 10:READ A:POKE PMBASE+7
68+80+J,A:NEXT J
150 POKE 559,46
160 POKE 623,16
170 POKE 704,198:POKE 706,88
180 POKE 707,204:POKE 711,198
190 POKE 712,34
200 POKE 53250,118
210 POKE 53251,140:POKE 53252,134
220 POKE 53253,118:POKE 53254,98
230 POKE 53255,74
240 POKE 53277,3
250 POKE 53256,3:POKE 53258,1
260 POKE 53260,255
270 POKE PMBASE+384+40,255
280 POSITION 4,3:? "  M3    M2   M1  M
0"
290 POSITION 4,4:? "128 64 32 16 8 4 2 1"
300 POSITION 4,5:? "——— ——— —— -
—":REM CONTROL/M
310 POSITION 2,8:? "POKE MISSILE DATA
AREA (0 TO 255) "
320 INPUT PO
330 POKE PMBASE+384+40,PO
340 ? CHR$(125):GOTO 280
350 REM ** M/C CLEAR ROUTINE**
360 DATA 104,104,133,204,104,133,203,1
04,133,206,104
370 DATA 133,205,166,206,160,0,169,0,1
45,203,136
380 DATA 208,251,230,204,202,48,6,208,
244,164
390 DATA 205,208,240,198,204,160,0,145
,203,96
400 REM *** SHAPE DATA ***
410 DATA 0,40,146,214,254,238,254,238,
186,170,56,16,0
420 DATA 24,36,24,90,126,60,24,24,24,3
6,102
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	13997	20	15962	30	13786
40	14275	50	13870	60	4015
70	2730	80	2669	90	2866
100	2903	110	7508	120	4219
130	9106	140	9094	150	1979
160	1945	170	4382	180	4389
190	1938	200	2589	210	5167
220	4983	230	2344	240	2136
250	4389	260	2598	270	3941
280	5574	290	5837	300	7153
310	9410	320	1861	330	3864
340	3456	350	4920	360	7331
370	6874	380	6307	390	6328
400	3666	410	7676	420	6118

Program II

resolution missiles starts at PMBASE plus 384, and for single resolution missiles at PMBASE plus 768; 40 is added to this value to plot the pixels part way down the screen.

In Program II we are only using missiles one pixel high. If you want taller ones, you would need to poke in more data. Of course, because the missile stripes are only two pixels wide, there is a limit to how complex the shapes plotted can be.

If you input a value of 1 then the right half of Missile 0 is plotted. A 2 plots the left hand side, and if you add these two together by inputting a value of 3 the whole width lights up.

Line 270 has switched on all the missile pixels along the width of the missile stripes by POKEing a value of 255 (128+64+32+16+8+4+2+1), which is the initial status of the missile when you first run the program.

You can see that by inputting various values, any combination of missiles can be achieved.

Missile movement is similar to that of players – altering the horizontal registers moves them from left to right, and re-plotting the data achieves vertical movement.

Because of the way missiles are plotted, it takes careful planning if you are writing a program that has, for example, all four missiles moving to different positions at the same time.

Collision detection for missiles is exactly the same as for players – just use the appropriate collision registers from Figure II.

Usually missiles take on the same colour as that of the player with the corresponding number. By adding 16 to address 623 (see Figure III), all missiles will take on the same colour as Playfield 3 (set by colour register 711).

Having all missiles the same colour is useful if you want to create a fifth player. Providing you do not want to use the missiles individually you can set the horizontal missile registers in such a way that the missile stipes are adjacent to each other, forming one stripe eight pixels wide which can be made to act like a fifth player. To see this at work add line 235:

```
235 POKE 53252,134:
    POKE 53253,142:
    POKE 53254,150:
    POKE 53255,158
```

These horizontal registers are set eight pixels apart to allow for the fact that the program is using quadruple size missiles. If you were using different size missiles, the above values would have to be altered to take account of this.

The shape information for this fifth player can then be loaded into the missile data area in exactly the same manner as a normal player. Vertical movement is the same, but horizontal movement requires that you alter all the missile horizontal registers each time you want to move the block.

Talk to the USA – the Atari way

WHILE many popular home micro owners find their thirst for knowledge on the subject of Spectrums, Commodores and the like satisfied by services such as Micronet 800, what of Atari owners with such cravings?

The answer lies, not in England, but across the North Atlantic in America, where online systems proliferate.

Let's take a look at what's available on the giant US database, CompuServe, located in Columbus, Ohio. In the US, CompuServe – whose large DEC-based set of computers holds literally gigabytes of data covering all aspects of computers, business and life in general – are the undoubted leader in providing on-line entertainment.

The diverse topics covered by this almost monolithic database include human sexuality, writing and politics, to mention but a few. Included in this diversity is the Atari area – a veritable Aladdin's cave of information for Atari owners. Both 8 bit and 16 bit owners are more than welcome here.

CompuServe's offerings fall into six main categories: Home Services, Business and Financial, Personal Computing Services for Professionals, User Information and the Index. Selecting any one of these choices takes you to further menus, each with as many as 25 further choices. Thus, from the deceptively few choices from the top menu, CompuServe takes you to literally a whole microcosm of options.

Where CompuServe really scored over its main rival in the early 1980s – The Source – was in its introduction of a real-time chat facility.

Called the CB Simulator, interactive chat took off right from the word go, and although expensive in terms of computer processing power, CompuServe's brave decision to offer a service everyone else thought would fail miserably has turned out to be their main source of online revenue – a feat much envied by The Source.

I'm sure we've all heard of the old joke about the daughter phoning her boyfriend in America, and poor old dad being landed with an enormous bill. This problem has always dogged UK computer users who wanted to access the large American databases.

However, while bulletin boards in the US must be accessed via direct dial, there exists in several countries – including the US and the UK – a network designed solely for the purpose of allowing computers to communicate with each other via a peripheral known as a modem.

Big computer users are connected permanently to the network via special datalines. Smaller and occasional users can connect into the network via dial up datalines, or packet switching exchanges.

To access a Packet Switching System (or PSS), you proceed exactly

```
CompuServe        ATARIDEV

One moment please...

Welcome to Atari Developers, V. 4A(110)

Hello, STEVE GULD
Last visit: 31-Jul-86 07:35:18

Forum messages:  9417 to  9703
Last message you've read:  3577


Atari Developers
FUNCTIONS
 1 (L) Leave a Message
 2 (R) Read Messages
 3 (CO) Conference Mode
 4 (DL) Data Libraries
 5 (B) Bulletins
 6 (MD) Member Directory
 7 (OP) User Options
 8 (IN) Instructions

 DOWNLOADING INSTRUCTIONS
 ------------------------

 Because this Forum supports the
interests of both the 8-bit line AND the
16-bit line of ATARI computers, the Data
Libraries (DLs) will contain a mixed bag
of files and programs. While text files
and articles may be of interest to
owners of either line, runnable programs
or source code listings are machine
specific. Therefore, before DOWnloading
*ANY* files from our DLs, you should
read the DEScription of the file
carefully to determine if it pertains to
your model of ATARI computer.

 You should also have read the
documentation and be familiar with the
operation and capabilities of your
terminal software before attempting to
DOWnload our files. The CIS DL softwar
has the ability to send files to your
ATARI in a variety of ways. However,
most ATARI term pgms can receive files
in 1 or 2 of these. Before you can
instruct CIS which PROTOCOL or method it
should use when sending you the file,
you must know which PROTOCOL your term
pgm is CAPABLE of receiving with.

 CIS currently supports the following
PROTOCOLS:
   XMODEM (or MODEM7)
   CIS A-protocol
   CIS B-protocol
   CAPTURE or "no protocol" (DC2/DC4)
```

```
ATARI 8-Bit Forum
FUNCTIONS
 1 (L)  Leave a Message
 2 (R)  Read Messages
 3 (CO) Conference Mode
 4 (DL) Data Libraries
 5 (B)  Bulletins
 6 (MD) Member Directory
 7 (OP) User Options
 8 (IN) Instructions

Enter choice !4

         *** CES Reports ***


     As announced in the Feb 85 issue,
ANTIC magazine will shortly be offering
an ONLINE edition on CompuServe.
Available at no additional charge, this
feature will include exclusive reports,
extensive database archive, interactive
reader polls, and much, much more!

     Final setup and CIS installation of
the ANTIC ONLINE EDITION is now in
progress, and we expect most of the
features will be available shortly.

     HOWEVER!  Rather than delay the
"hottest" info on the "hottest" computer
company in the business during this
setup period, ANTIC has generously
provided SIG*ATARI members with the
details of their exclusive meeting with
ATARI President, Sam Tramiel, and ATARI
Software boss, Sig Hartmann.

     This report and the full series o
CES reports from the staff of ANTIC are
available in DL7 now.  To see the
descriptions of each report and read the
text, enter DL7 and type:


     BRO ANTIC?.CES


DL 7 - HOT News/Rumors

 1 (DES) Description of Data Library
 2 (BRO) Browse thru files
 3 (DIR) Directory of files
 4 (UPL) Upload a new file
 5 (DOW) Download a file
 6 (DL)  Change Data Library
 7 (T)   Return to Function Menu
 8 (I)   Instructions
```

By STEVE GOLD



as you would when signing on to a bulletin board – you dial the number (normally local), connect your modem and communicate with the service concerned. In the case of packet switching, you must first link with the packet switching node – log-on in communications parlance – and then set up a datacall to the distant host computer.

I know this sounds complicated, but rest assured it isn't. It's easy, and above all else, it's CHEAP. Datacalls, because of their nature of packeting data down telephone and datalines, can share a single line, provided the data is clearly packeted for easy decoding at the distant host computer.

By skilful use of hi-tech switching, several datacalls can be stacked onto a single call, allowing the callers to share the costs of making a datacall.

In the case of North American datacalls the savings can be quite large – calling the US works out at 7.5 pence per minute, as opposed to the 80 pence or so that a typical voice call costs.

When the data costs are added to the time costs, then the actual cost of making a call to a US service such as CompuServe can work out to a quite reasonable 12 to 15 pence a minute.

The Atari areas on CompuServe are huge. Split into four parts, the Atari sections of CIS fill a complete DEC 10 mainframe, which forms just part of the CIS network of DEC computers, all of which are located in Columbus, Ohio. The four main sections on CIS are: Antic Online, the Atari 16 bit forum, the Atari 8 bit forum and the Atari developers forum.

Antic Online, as the name implies, is an area run by Antic, the US magazine for Atari owners. Contents include features from future issues, as well as extracts from previous issues. A flavour of what the service is like can be seen from the excerpts on the left.

The Atari 8 bit, 16 bit and developers forums are for the differing requirements of the XL, XE and ST owners and are, in effect, a microcosmic bulletin board system in their own right, controlled separately from CompuServe by SIG-OPS – Special Interest Group Operators, a corruption of the term sysops, which stands for system operators.

Like BBSs, the forums allow callers to read, leave and reply to messages left on the board, as well as load and download public domain programs. Several terminal programs

are included in the vast CIS program library, all of which may be downloaded at whim, using Ascii file capture or X-Modem with error-checking.

Of course, like most things in life, you will only get out of the Atari forums what you put in. Someone has to upload the public domain software and, with this in mind, CompuServe waives its connect time fees while an upload is in progress – there is, of course, no way that the PSS costs can be avoided in this case, but it's still a step in the right direction.

While databases like CompuServe cost money to access, many philanthropic souls will allow you to access their bulletin boards for nothing more than the cost of a phone call.

Listed right are a selection of Atari bulletin boards – all located in the USA – that are well worth a call to get a taste of the Atari on-line world. As well as the public boards, Atari themselves offer a free dial-up BBS, which can be accessed from the UK on 0101-408-745-5308.

Most of the Atari-orientated boards will give an up-to-date listing of Atari boards elsewhere in North America and Canada – and there are far more of them than can be listed here. Remember, though, that as BBSs are single-user systems there is only one phone line, so don't be surprised if you get an engaged tone.

The best time to call the US BBSs is early morning in the UK, preferably around breakfast time, when it is the wee small hours in the US, and (hopefully) the regular BBS users will have gone to bed.

Bulletin board	Phone number	Speeds
Joes Computer	*0101 205 288 1100*	*300/1200*
Aardwolf-Express	*0101 415 651 4147*	*300/1200*
UFONET	*0101 303 278 4244*	*300/1200*
Armudic	*0101 202 276 8342*	*300*
Orlando Connection	*0101 305 644 8327*	*300*
Aurora Computers	*0101 312 897 9037*	*300*
RCP/M	*0101 504 273 3116*	*300*
Barton Data Line	*0101 313 662 8303*	*300*
MACE West	*0101 313 274 3940*	*300*
GRASS	*0101 616 241 1941*	*300*
TAIG	*0101 612 432 3779*	*300*

Some of the more popular bulletin boards in the USA that cater specifically for Atari users

American $cene

EDWARD SHARK reports

HAVING fully recovered from a hectic few days spent at the Consumer Electronics Show in Chicago, I'm able to report on a couple of the more interesting items on show for the 8 bit Atari range.

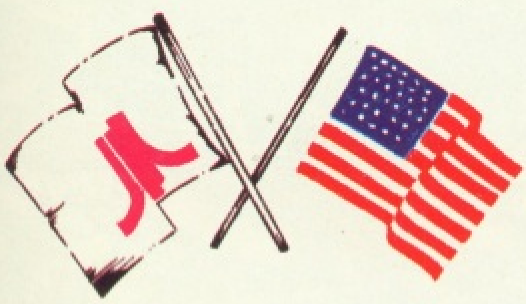
First off was the much rumoured XEP-80, a box about the size of the 850 interface which gives a crisp 80 column display on a black and white monitor.

Currently most software cannot take advantage of this new capability, but many software companies are enhancing their programs to use the 80 column mode. The XEP-80 should be available by the end of the year for around £80. It is also likely to become part of the word processor package that Sam Tramiel announced at the Atari User Show in London in March.

Hardware company ICD announced a new I/O and memory board for the 8 bit range. The ICD Multi I/O board comes with parallel, serial and hard disc ports as standard and is available with two sizes of memory. The 256K version will cost £199, while the 1mb version will be £349.

Also at the show, Infocom announced two additions to its ever growing range. Leather Goddesses of Phobos is a new Infocom Plus adventure that has you kidnapped by wild women and taken off to Phobos, one of the moons of Mars.

LGP is another game from the keyboard of Steve Meretzky of



Planetfall and Hitch Hiker's Guide to the Galaxy fame.

The other new offering is called Moonmist. This beginner level offering is slightly more grown up than Infocom's other beginner games and the firm hopes it will attract further thousands of their range of interactive fiction adventures.

Both adventures are set to be available simultaneously in the US and the UK in early October.

Activision, the Californian entertainment software company, has reached an agreement to merge with Infocom. Activision chairman and chief executive officer James Levy said Activision will exchange two million Activision shares, currently valued at £7.5 million, for all outstanding shares in Infocom.

Activision will take over the distribution of all Infocom products,



thereby cutting the price on all Infocom products in the UK. For its part, Infocom will maintain separate product development and marketing operations in Cambridge, near Boston.

Activision has also recently acquired Gamestar, creator of Championship Golf, and GBA Championship Basketball, two ST games due for an autumn release, and Creative Software, a productivity software company.

Activision was founded in 1979 when five dissatisfied employees left Atari to form their own VCS games cartridge company.

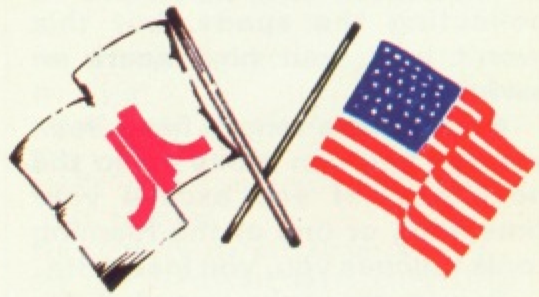
In the Atari ST software world we're starting to see some very powerful desk accessories. These programs stay resident in memory and provide features that can be used at any time by programs which take advantage of the GEM environment.

From Michtron, we have Cornerman. This program offers features comparable with the much acclaimed Sidekick package for the IBM PC and clones. It includes: a full Ascii chart in a scrolling window, a calculator with decimal, hex, binary, and octal functions, a note pad, a phone dialler, a clock (which appears in the upper right corner of any GEM screen), and much more.

Cornerman is probably most suited to a 1mb ST, since it uses up a fair bit of RAM, but it has drawn rave reviews from several 520 owners in my area.

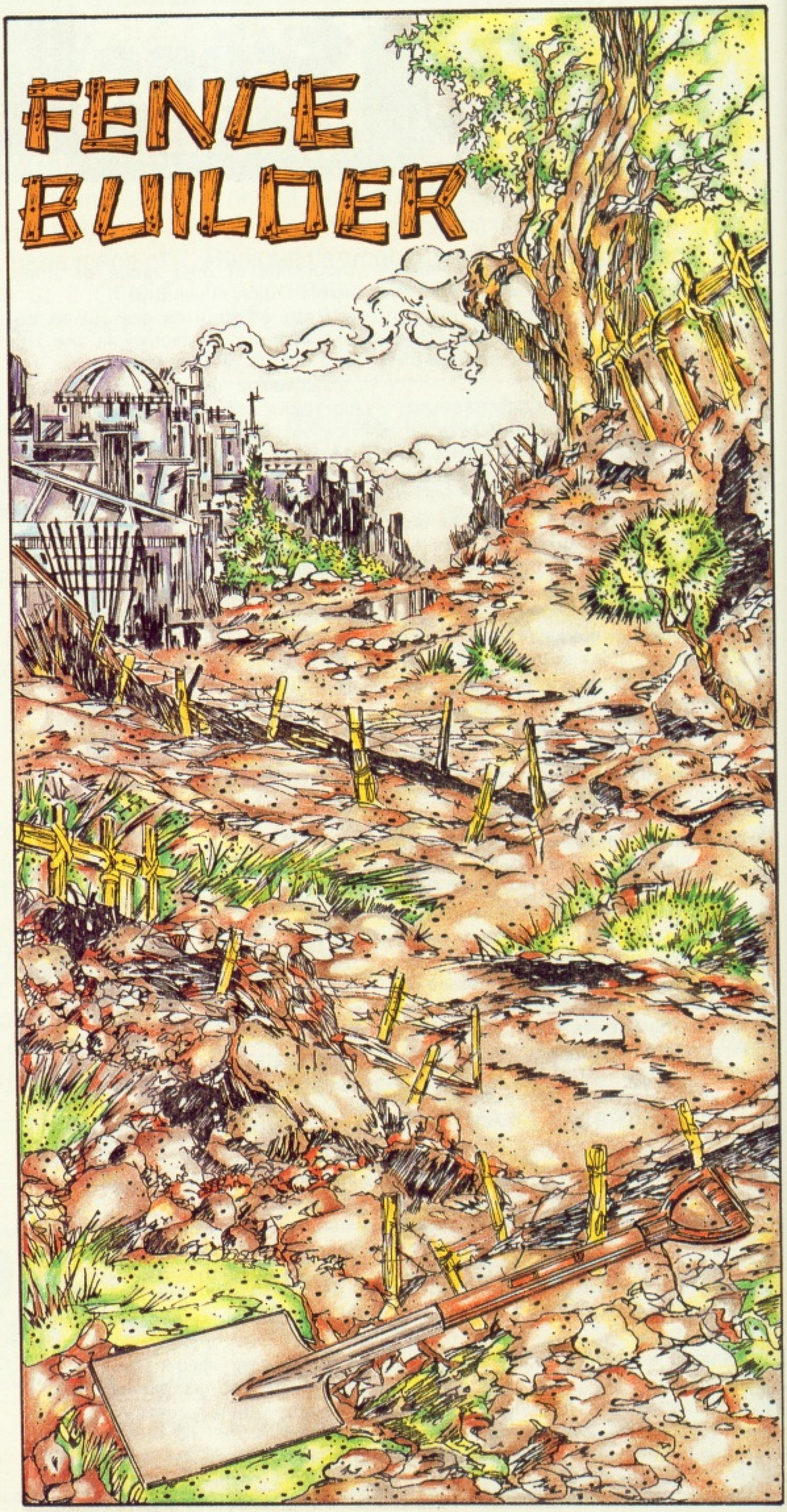
A recent arrival on the US scene will probably give Cornerman a run for its money. Macro Manager, from Blue Moon Software (distributed by Shanner International), is a very complete accessory. Its calculator works in algebraic and Reverse Polish notation (remember that?) and also includes financial functions. It also contains a weekly planner with project time reporting, electronic card file database, alarm clock calendar and an electronic typewriter feature.

One of the latest programs to hit the stores in the States is Thunder from Batteries Included. This is a



realtime spelling checker for GEM applications. While you're typing, it checks your spelling and buzzes if you make an error. Neat.

By clicking on the desk accessory menu it will tell you what word was wrong and offers you a choice of corrections. Thunder comes with a 50,000 word dictionary for starters, which is expandable via two further dictionaries, one with supplemental words and the other with replacement words. You give it a word and an automatic replacement for words you commonly misspell. Abbreviations are automatically expanded for you.



IT'S arcade time again, and this month we have a real challenge for you. Your task is deceptively simple – you must build a number of fences with the materials provided.

Unfortunately most of your tools have been exposed to a radiation leak from a nearby nuclear power plant and are even now roaming the countryside wreaking havoc among the local fence-building population. Should one touch you you will die.

Still, a job's a job, and you must find a way to build the fences. You will see three items at the top of the screen – a spade, some fence posts and some fence rails. Using your joystick button, you may pick up three posts or three rails at a time.

To plant a post just position yourself under a hole and press the button. Similarly you may erect a section of fencing by

By A. & R. LINES

collecting railing pieces and standing next to a fence post as you press the button. If you bump into anything else you will simply bounce off again.

You may fill in the holes by collecting the spade, but this won't help your high score an awful lot.

Once all the fences have been erected you can move on to the next level. If you exceed your time limit, or one of the roaming tools touches you, you lose a life.

Points are only awarded for erecting a piece of fence, although there is a bonus for completion of each level.

When typing the program in, don't forget to POKE 82,0 first. This will enable you to enter some of the longer lines. You may also use abbreviations – such as GR. for GRAPHICS, and SE. for SETCOLOR – to speed up your typing.

If you have any problems use the checksum table and the Get-It-Right! program from the last issue. This will ensure that you have typed it in correctly.

NUMERIC VARIABLES

Variable	Description
A, B, I	General purpose variables, used for FOR ... NEXT counters, PEEKs and POKEs, user variable and so on.
BFLAG	Flag used to decide whether a bonus is awarded. No bonus if flag is set.
BONUS	Holds value of bonus awarded.
C	Indicates if an object is being carried, and if so what.
CHACT	Address of memory reserved for new character set for the USR routine.
COUNT	Number of pieces held.
DIFF	Holds skill level chosen.
DL	User for display list PEEKs and POKEs.
DX	Used to move player 1 left or right, and to choose left or right-facing player.
DY	Used to move player 1 up or down.
FEN	Holds target number of fence pieces to be put up in any particular round.
GM	Graphic mode used for game screen.
IT	Holds value of character above player 1 when button is pressed.
L	Used to select five different forms of left facing player 1.
LEV	Holds the starting and finishing points of each row of holes.
LEVEL	Holds number of screen setting to be displayed.
LIFE	Holds number of lives left.
LIMIT	Holds time limit for the particular level.
MEM	Holds page number where character set data is stored.
MST	Holds page 6 memory location for music routine.
N1, N2, N3, N4, N5, N6	Holds high scores.
OT	Used by timer routine.
PL	Holds value of character above and to left of player 1 when button pressed.
PMOVE	Holds address of player moving routine.
PR	Similar to PL, but to right not left.
R	Similar to L, but for right-facing players.
SCORE	Holds current score.
SET	Used in character set routine.
TIME	Holds value of timer.
TRIG	Trigger pressed flag.
UP	Holds number of holes in a screen.
V0, V1, V2, V200, V21, V250, V36, V5, V50	Constant numbers held as variables.
X	X coordinate of player 1.
X1	Used by LOCATE Statement.
Y	Y coordinate of player 1.
Y1	Used by LOCATE statement.

STRING VARIABLES

Variable	Description
A$	String input and temporary storage.
BYTE$	Holds machine code routine.
C$	Used to clear screen.
G$, G1$, G2$, G4$, G5$, G6$	Holds screen data for printout.
L1$, L2$, L3$, L4$, L5$	Holds left-facing players.
N1$, N2$, N3$, N4$, N5$	Holds high scores names.
N6$	Temporary store for high score names.
P$	used for moving player.
PMOVE$	Holds routine for moving players 2 and 3.
R1$, R2$, R3$, R4$, R5$	Holds right facing players.
T1$, T2$, T3$, T4$, T5$, T6$	Holds players 2 and 3.

```
10 REM FENCES - (C) ATARI USER,
      SEPTEMBER 1986
100 REM SOME OF THESE LINES ARE TOO
   LONG TO ENTER ON DEFAULT SCREEN SO
     REMEMBER TO USE   POKE 82,0
120 GOSUB 5560
140 DIM P$(2048),T1$(22),T2$(22),T3$(2
2),T4$(22),T5$(22),T6$(22)
160 DIM R1$(22),R2$(22),R3$(22),R4$(22
),R5$(22),L1$(22),L2$(22),L3$(22),L4$(
22),L5$(22),N5$(10)
180 DIM G$(40),G1$(40),G2$(40),G3$(40)
,G4$(40),G5$(40),G6$(40)
200 DIM M$(22),C$(22),LEV(5,2),FILE$(2
0),REP$(1),BYTE$(80),A$(1)
220 DIM N1$(10),N2$(10),N3$(10),N4$(10
),N6$(10),PMOVE$(18)
240 GOSUB 6120:GOSUB 5460:GOSUB 5060:G
OSUB 6080:GM=4:GOSUB 2560:POKE 82,0:GO
SUB 2020
260 B=PEEK(106)-23:POKE 54279,B
280 V=PEEK(135)*256+PEEK(134):A=PEEK(1
41)*256+PEEK(140):O=B*256-A:A=INT(O/25
6):B=O-A*256:POKE V+3,A:POKE V+2,B
300 POKE 623,2:POKE 705,26:POKE 559,62
:POKE 53258,0:POKE 53259,0:POKE 53277,
3
320 GOSUB 4500:GOSUB 1080:GOSUB 4760:P
OKE 704,12:GOTO 360
340 REM JOYSTICK ROUTINE
360 S=STICK(0):TRIG=STRIG(0):DX=(S=5 O
R S=6 OR S=7)-(S=9 OR S=10 OR S=11):DY
=(S=5 OR S=9 OR S=13)-(S=6 OR S=10 OR
S=14)
380 X=X+DX*3:Y=Y+DY*4:TIME=PEEK(19):IF
 TIME<>OT THEN GOSUB 2840
400 POKE 53278,0:Z=USR(PMOVE):Z=USR(PM
OVE)
420 IF PEEK(53260)>V0 THEN 2960
440 IF Y>38 OR TRIG=1 THEN 520
460 IF X>109 AND X<119 THEN C=3:GOTO 7
80
480 IF X>129 AND X<139 THEN C=4:GOTO 7
80
500 IF X>157 AND X<167 THEN C=5:GOTO 7
80
520 IF (TRIG=1 OR Y<56) OR (COUNT<1 OR
 C<3) THEN 800
540 Y1=INT(Y-28)/8-1:X1=INT(X-46)/4
560 TRAP 360:LOCATE X1,Y1,IT:POSITION
X1,Y1:PUT #6,IT
580 TRAP 360:LOCATE X1-1,Y1,PL:POSITIO
N X1-1,Y1:PUT #6,PL:LOCATE X1+1,Y1,PR:
POSITION X1+1,Y1:PUT #6,PR
600 IF IT=ASC("d") AND C=3 THEN 680
620 IF IT=ASC("c") AND C=4 THEN 700
640 IF IT=ASC("d") AND C=5 THEN 740
660 GOTO 800
680 POSITION X1,Y1:PUT #6,98:POSITION
X1,Y1-1:PUT #6,98:GOTO 760
700 IF PL<>ASC("b") AND PR<>ASC("b") T
HEN 800
720 POSITION X1,Y1:PUT #6,97:POSITION
X1,Y1-1:PUT #6,97:GOSUB 2640:GOTO 760
740 POSITION X1,Y1:PUT #6,99
760 COUNT=COUNT-1:GOTO 800
```

→

```
780 COUNT=3:FOR D=60 TO 65:SOUND 2,D,1
0,14:NEXT D:SOUND 2,0,0,0
800 IF DX=V0 AND DY=V0 THEN 360
820 IF X<V50 THEN X=V50
840 IF X>V200 THEN X=V200
860 IF Y<V36 THEN Y=V36
880 IF DX<V0 THEN L=L+V1
900 IF Y>V200 THEN Y=V200
920 IF L>5 THEN L=V1
940 IF DX>-1 THEN 1000
960 ON L GOSUB 1080,1100,1120,1140,116
0
980 GOTO 1040
1000 R=R+1:IF R>5 THEN R=1
1020 ON R GOSUB 1180,1200,1220,1240,12
60
1040 IF Y>54 AND PEEK(53252)>0 THEN GO
SUB 3700
1060 GOTO 360
1080 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=L1$:POKE 53248,X:RETURN
1100 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=L2$:POKE 53248,X:RETURN
1120 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=L3$:POKE 53248,X:RETURN
1140 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=L4$:POKE 53248,X:RETURN
1160 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=L5$:POKE 53248,X:RETURN
1180 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=R1$:POKE 53248,X:RETURN
1200 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=R2$:POKE 53248,X:RETURN
1220 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=R3$:POKE 53248,X:RETURN
1240 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=R4$:POKE 53248,X:RETURN
1260 Z=USR(PMOVE):Z=USR(PMOVE):P$(Y,Y+
V21)=R5$:POKE 53248,X:RETURN
1280 REM Read PM into strings
1300 POKE 53248,0:POKE 53251,0:POKE 53
250,0
1320 RESTORE 1680:FOR W=1 TO 22:READ X
:L1$(W,W)=CHR$(X):NEXT W
1340 RESTORE 1700:FOR W=1 TO 22:READ X
:L2$(W,W)=CHR$(X):NEXT W
1360 RESTORE 1720:FOR W=1 TO 22:READ X
:L3$(W,W)=CHR$(X):NEXT W
1380 RESTORE 1740:FOR W=1 TO 22:READ X
:L4$(W,W)=CHR$(X):NEXT W
1400 RESTORE 1760:FOR W=1 TO 22:READ X
:L5$(W,W)=CHR$(X):NEXT W
1420 RESTORE 1780:FOR W=1 TO 22:READ X
:R1$(W,W)=CHR$(X):NEXT W
1440 RESTORE 1800:FOR W=1 TO 22:READ X
:R2$(W,W)=CHR$(X):NEXT W
1460 RESTORE 1820:FOR W=1 TO 22:READ X
:R3$(W,W)=CHR$(X):NEXT W
1480 RESTORE 1840:FOR W=1 TO 22:READ X
:R4$(W,W)=CHR$(X):NEXT W
1500 RESTORE 1860:FOR W=1 TO 22:READ X
:R5$(W,W)=CHR$(X):NEXT W
1520 RESTORE 1880:FOR W=1 TO 22:READ X
:T1$(W,W)=CHR$(X):NEXT W
1540 RESTORE 1900:FOR W=1 TO 22:READ X
:T2$(W,W)=CHR$(X):NEXT W
1560 RESTORE 1920:FOR W=1 TO 22:READ X
:T3$(W,W)=CHR$(X):NEXT W
1580 RESTORE 1940:FOR W=1 TO 22:READ X
:T4$(W,W)=CHR$(X):NEXT W
1600 RESTORE 1960:FOR W=1 TO 22:READ X
:T5$(W,W)=CHR$(X):NEXT W
1620 RESTORE 1980:FOR W=1 TO 22:READ X
:T6$(W,W)=CHR$(X):NEXT W:GOSUB 4760:RE
TURN
1640 REM PM data info
1660 DATA 0,0,0,0,24,24,8,8,28,58,89
,24,40,40,100,2,2,0,0,0,0
1680 DATA 0,0,0,0,24,24,8,8,28,20,58
,24,24,56,38,34,96,0,0,0,0
1700 DATA 0,0,0,0,24,24,8,8,28,20,58
,24,24,52,36,98,6,0,0,0,0
1720 DATA 3,0,0,0,24,24,8,8,24,24,28
,56,24,16,24,20,52,0,0,0,0
1740 DATA 0,0,0,0,24,24,8,8,24,24,24
,24,24,16,8,12,24,0,0,0,0
1760 DATA 0,0,0,0,24,24,8,8,24,28,42
,24,24,56,100,4,12,0,0,0,0
1780 DATA 0,0,0,0,24,24,16,16,56,40,
92,24,24,28,100,68,6,0,0,0,0
1800 DATA 0,0,0,0,24,24,16,16,56,40,
92,24,24,44,36,70,96,0,0,0,0
1820 DATA 0,0,0,0,24,24,16,16,24,24,
56,28,24,8,24,40,44,0,0,0,0
1840 DATA 0,0,0,0,24,24,16,16,24,24,
24,24,24,8,16,48,24,0,0,0,0
1860 DATA 0,0,0,0,24,24,16,16,24,56,
84,24,24,28,38,32,48,0,0,0,0
1880 DATA 0,0,0,0,0,192,252,246,210,
16,16,16,16,16,16,16,16,16,0,0
1900 DATA 0,0,0,0,0,3,63,111,75,8,8,
8,8,8,8,8,8,8,8,0,0
1920 DATA 0,0,0,0,14,6,14,6,14,6,14,6,
14,6,14,62,58,34,62,0,0,0
1940 DATA 0,0,0,0,112,96,112,96,112,96
,112,96,112,96,112,124,92,68,124,0,0,0
1960 DATA 0,0,0,0,0,0,14,202,46,20,12,
31,14,14,14,14,4,4,4,4,4,0
1980 DATA 0,0,0,0,0,0,112,83,116,40,48
,248,112,112,112,112,32,32,32,32,32,0
2000 REM SET UP SCREEN
2020 G$="c":G$(40)=G$:G$(2)=G$
2040 G1$="ccccccccccccccccbccccaccccc
egcccccccccc"
2060 G2$="ccccccccccccccccbccccaccccc
fhcccccccccc"
2080 G3$=G$:G4$=G$:G5$=G$:G6$=G$
2100 IF LEVEL=0 THEN RESTORE 3880:LIMI
T=37:UP=14
2120 IF LEVEL=1 THEN RESTORE 3860:LIMI
T=37:UP=15
2140 IF LEVEL=3 THEN RESTORE 3820:LIMI
T=37:UP=17
2160 IF LEVEL=2 THEN RESTORE 3840:LIMI
T=37:UP=17
2180 IF LEVEL=4 THEN RESTORE 3900:LIMI
T=37:UP=18
2200 IF LEVEL=5 THEN RESTORE 4000:LIMI
T=53:UP=26
2220 IF LEVEL=6 THEN RESTORE 3980:LIMI
T=60:UP=29
2240 IF LEVEL=7 THEN RESTORE 3960:LIMI
T=60:UP=29
2260 IF LEVEL=8 THEN RESTORE 3920:LIMI
T=77:UP=35
2280 IF LEVEL=9 THEN RESTORE 3940:LIMI
T=85:UP=39
2300 FOR LOOP=0 TO 3:READ START:READ F
IN:LEV(LOOP,0)=START:LEV(LOOP,1)=FIN:N
EXT LOOP
2320 FOR VAR=LEV(0,0) TO LEV(0,1) STEP
 2:G3$(VAR,VAR+1)="cd":NEXT VAR
2340 FOR VAR=LEV(1,0) TO LEV(1,1) STEP
 2:G4$(VAR,VAR+1)="cd":NEXT VAR
2360 FOR VAR=LEV(2,0) TO LEV(2,1) STEP
 2:G5$(VAR,VAR+1)="cd":NEXT VAR
2380 FOR VAR=LEV(3,0) TO LEV(3,1) STEP
 2:G6$(VAR,VAR+1)="cd":NEXT VAR
2400 ? CHR$(125):P$(Y,Y+21)=C$:X=123:Y
=38:GOSUB 1160
2420 ? G1$;G2$;G$;G3$;G$;G$;G$;G$;
2440 ? G4$;G$;G$;G$;G$;G5$;G$;G$;G$;G$
;G6$;G$;G$;G$;
2460 POSITION 0,0:? "LIMIT: ";LIMIT;:P
OSITION 15,0:? "POST";:POSITION 20,0:?
 "FENCE";:POSITION 26,0:? "SPADE";
2480 POSITION 32,0:? "FENS:";UP-FEN;
2500 POSITION 1,23:? "TIME: ";TIME;:PO
SITION 10,23:? "MEN: ";LIFE;:POSITION
17,23:? "SCORE: ";SCORE;
2520 POKE 53761,164:Z=USR(1536):POSITI
ON 35,23:? "L:";LEVEL+1;:POKE 18,0:POK
E 19,0:RETURN
2540 REM SET UP DL
2560 GOSUB 5960:? CHR$(125):SETCOLOR 4
,13,4:SETCOLOR 0,14,2:SETCOLOR 2,0,0:S
ETCOLOR 1,14,6
2580 POKE 752,1:DL=PEEK(560)+PEEK(561)
*256:POKE DL+3,2+64
2600 FOR N=0 TO 22:POKE DL+6+N,GM:NEXT
 N:POKE DL+28,2:RETURN
2620 REM SCORE UPDATE
2640 SCORE=SCORE+10:POSITION 24,23:? S
CORE;:FEN=FEN+1:IF FEN=UP THEN LEVEL=L
EVEL+1:UP=0:? CHR$(125)
2660 IF UP>0 THEN RETURN
2680 Z=USR(1559):SOUND 0,0,0,0
2700 IF BFLAG>0 THEN 2780
2720 BONUS=0:IF TIME<LIMIT THEN BONUS=
(LIMIT-TIME)*50
2740 POSITION 16,0:? "BONUS= ";BONUS:F
OR JUMP=0 TO BONUS STEP 10:SCORE=SCORE
+10:SOUND 2,30,8,10
2760 FOR DEL=0 TO 10:NEXT DEL:SOUND 2,
0,0,0:POSITION 16,23:? "SCORE= ";SCORE
;:NEXT JUMP
2780 BFLAG=0:GOSUB 4840:FEN=4-DIF:GOSU
B 2020:M=INT(RND(0)*250+3):M1=INT(RND(
0)*250+3)
2800 POKE 203,M:POKE 204,M1:RETURN
2820 REM TIME UPDATE
2840 POSITION 7,23:? "   ";:POSITION 7
,23:? TIME;:OT=TIME
2860 IF TIME=LIMIT-5 THEN GOSUB 6100:S
OUND 2,0,0,0:POKE 19,OT:RETURN
2880 IF TIME<=LIMIT THEN POKE 19,OT:RE
TURN
2900 IF TIME>LIMIT THEN POP :POKE 19,0
:OT=0
2920 POSITION 7,23:? "  ";:POSITION 7,
23:? OT;:GOTO 2960
```

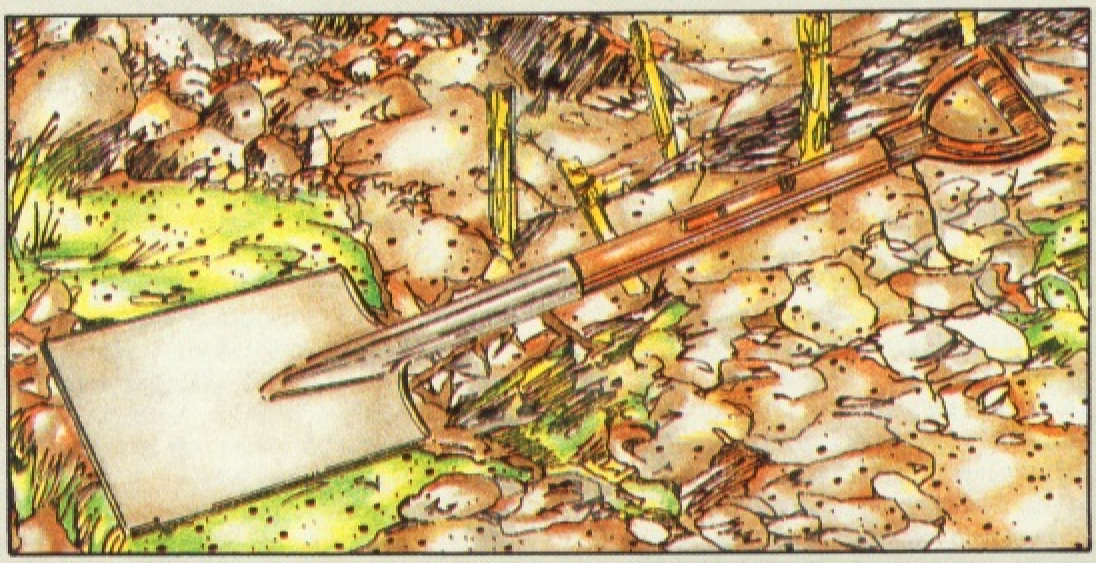
```
2940 REM DEATH ROUTINE
2960 BFLAG=BFLAG+1:LIFE=LIFE-1:POSITION 15,23:? LIFE;:P$(Y,Y+21)=C$:X=123:Y=38
2980 RESTORE 3040:Z=USR(1559):SOUND 0,0,0,0
3000 READ A,W:IF A>0 THEN SOUND 1,A,10,6:FOR I=1 TO W*2:NEXT I
3020 IF A>0 THEN SOUND 1,0,0,0:FOR W=1 TO 5:NEXT W:GOTO 3000
3040 DATA 100,30,100,20,100,5,100,30,83,30,90,30,100,20,105,10,100,30
3060 DATA -1,0
3080 IF LIFE<>0 THEN POKE 53761,166:Z=USR(1536):POKE 19,OT:GOTO 880
3100 POKE 704,226:POKE 53251,0:POKE 53250,0:POKE 53248,0:X=USR(1559):SOUND 0,0,0,0
3120 POKE 559,34:POKE 53277,0:POKE 53278,0:POKE 53279,0:GRAPHICS 2+16:SETCOLOR 0,3,4
3140 SETCOLOR 1,0,6:SETCOLOR 2,12,4:SETCOLOR 3,13,10:IF SCORE>N5 THEN N5=SCORE:GOTO 3180
3160 GOTO 3400
3180 POSITION 1,6:? #6;"ENTER YOUR NAME":POSITION 1,8:FOR Z=1 TO 10:? #6;CHR$(13);:NEXT Z
3200 POSITION 1,7:POKE 764,255:OPEN #1,4,0,"K:":FOR Q=1 TO 10:GET #1,R:A$=CHR$(R)
3220 IF R=155 THEN N5$(Q,Q)=" ":FOR D=Q TO 10:N5$(D,D)=" ":NEXT D:Q=10:NEXT Q:CLOSE #1:? #6;CHR$(125):GOTO 3280
3240 IF R=126 THEN Q=Q-1:POSITION Q,7:? #6;" ";:POSITION Q,7:Q=Q-1:NEXT Q
3260 ? #6;A$;:N5$(Q,Q)=A$:NEXT Q:CLOSE #1:? #6;CHR$(125)
3280 FOR Q=1 TO 10:A$=N1$(Q,Q):A=ASC(A$):A=A-128:N1$(Q,Q)=CHR$(A):NEXT Q
3300 IF N5>N4 THEN N6=N4:N6$=N4$:N4=N5:N4$=N5$:N5=N6:N5$=N6$
3320 IF N4>N3 THEN N6=N3:N6$=N3$:N3=N4:N3$=N4$:N4=N6:N4$=N6$
3340 IF N3>N2 THEN N6=N2:N6$=N2$:N2=N3:N2$=N3$:N3=N6:N3$=N6$
3360 IF N2>N1 THEN N6=N1:N6$=N1$:N1=N2:N1$=N2$:N2=N6:N2$=N6$
3380 FOR Q=1 TO 10:A$=N1$(Q,Q):A=ASC(A$):A=A+128:N1$(Q,Q)=CHR$(A):NEXT Q
3400 ? #6;CHR$(125):POKE 756,MEM:? #6;"   hall of fame"
3420 POSITION 1,3:? #6;N1$;" ";N1:? #6;" ";N2$;" ";N2:? #6;" ";N3$;" ";N3
3440 ? #6;" ";N4$;" ";N4:? #6;" ";N5$;" ";N5
3460 COLOR 252:PLOT 0,2:DRAWTO 19,2:COLOR 253:DRAWTO 19,7
3480 COLOR 254:PLOT 19,8:DRAWTO 0,8:COLOR 251:DRAWTO 0,3
3500 POSITION 3,10:? #6;"press any key"
3520 POKE 764,255:OPEN #1,4,0,"K:":GET #1,R:CLOSE #1:? #6;CHR$(125)
3540 POSITION 3,0:? #6;"FENCE BUILDER":POSITION 5,7:? #6;"GAME OVER":IF SCORE>HIGH THEN HIGH=SCORE
3560 POSITION 2,3:? #6;"high score ";HIGH
3580 POSITION 2,4:? #6;"last score ";SCORE
3600 POSITION 0,10:? #6;"do you want to play          again";
3620 TRAP 3620:POKE 764,255:OPEN #1,4,0,"K:":GET #1,R:CLOSE #1
3640 IF R<>ASC("N") THEN GRAPHICS 0:POKE 756,MEM:GM=4:GOSUB 2560:GOSUB 4760:GOSUB 2020:GOSUB 4740:GOTO 360
3660 END
3680 REM REBOUND
3700 P$(Y,Y+21)=C$:IF DX=-1 THEN X=X+8
3720 IF DX=1 THEN X=X-8
3740 IF DY=-1 THEN Y=Y+16
3760 IF DY=1 THEN Y=Y-16
3780 GOSUB 1080:RETURN
3800 REM SCREEN DATA
3820 DATA 24,26,20,28,14,22,27,35
3840 DATA 28,34,22,24,25,33,18,28
3860 DATA 2,4,12,18,22,28,19,27
3880 DATA 10,12,2,10,26,34,24,26
3900 DATA 29,35,12,18,19,23,8,20
3920 DATA 3,15,15,33,6,24,16,30
3940 DATA 3,15,11,35,19,37,8,24
3960 DATA 4,16,26,36,12,30,2,12
3980 DATA 8,20,2,12,18,30,4,20
4000 DATA 15,27,6,12,14,26,20,34
4020 REM CHARACTER SET - SETUP
4040 MEM=PEEK(106)-4:POKE 106,MEM-1:CHACT=MEM*256:GRAPHICS 0:SETCOLOR 1,0,10:SETCOLOR 2,0,0:GOSUB 5720
4060 RESTORE 4080:FOR LOOP=1 TO 32:READ PGM:BYTE$(LOOP,LOOP)=CHR$(PGM):NEXT LOOP
4080 DATA 104,104,133,213,104,133,212
4100 DATA 104,133,215,104,133,214,162
4120 DATA 4,160,0,177,212,145,214
4140 DATA 200,208,249,230,213,230,215
4160 DATA 202,208,240,96
4180 Z=USR(ADR(BYTE$),224*256,CHACT)
4200 RESTORE 4240:FOR LOOP=1 TO 12:READ CHAR:SET=CHACT+CHAR*8
4220 FOR T=0 TO 7:READ BYTE:POKE SET+T,BYTE:NEXT T:NEXT LOOP
4240 DATA 59,192,192,192,192,192,192,192,192
4260 DATA 60,0,0,0,0,0,0,255,255
4280 DATA 62,255,255,0,0,0,0,0,0
4300 DATA 97,170,170,170,170,170,170,170,170
4320 DATA 98,150,150,150,150,150,150,150,150
4340 DATA 99,0,0,0,0,0,0,0,0
4360 DATA 100,5,21,85,125,125,85,20,0
4380 DATA 101,0,21,16,21,1,1,1,1
4400 DATA 102,1,1,1,61,61,61,63,63
4420 DATA 103,0,80,16,80,0,0,0,0
4440 DATA 104,0,0,0,240,240,240,240,240
4460 DATA 61,3,3,3,3,3,3,3,3
4480 POKE MEM-1,0:POKE 756,MEM:RETURN
4500 C$=CHR$(0):C$(22)=C$:C$(2)=C$:P$=CHR$(0):P$(2048)=P$:P$(2)=P$:RETURN
```

→

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	9161	100	57507	120	1987
140	9132	160	13412	180	8496
200	9652	220	8516	240	14832
260	4725	280	18646	300	12877
320	9771	340	10232	360	20693
380	11455	400	7768	420	4540
440	4778	460	6209	480	6224
500	6229	520	8672	540	5463
560	9809	580	18690	600	5410
620	5407	640	5417	660	1622
680	11395	700	7319	720	13267
740	4741	760	4401	780	10948
800	4600	820	3526	840	3983
860	3572	880	3658	900	3990
920	2970	940	2947	960	5833
980	1864	1000	3800	1020	5883
1040	7318	1060	1630	1080	12382
1100	12383	1120	12384	1140	12385
1160	12386	1180	12412	1200	12413
1220	12414	1240	12415	1260	12416
1280	14101	1300	6614	1320	10896
1340	10883	1360	10889	1380	10895
1400	10901	1420	10903	1440	10890
1460	10896	1480	10902	1500	10908
1520	10906	1540	10893	1560	10899
1580	10905	1600	10911	1620	14598
1640	8010	1660	8700	1680	8978
1700	8759	1720	8920	1740	8714
1760	8900	1780	9115	1800	9173
1820	8983	1840	8989	1860	9161
1880	9889	1900	7831	1920	8677
1940	10644	1960	8890	1980	10444
2000	8017	2020	3937	2040	12754
2060	12763	2080	4398	2100	8473
2120	8472	2140	8470	2160	8475
2180	8471	2200	8442	2220	8489
2240	8484	2260	8483	2280	8502
2300	16504	2320	12127	2340	12136
2360	12145	2380	12154	2400	8215
2420	4900	2440	7764	2460	19751
2480	5734	2500	17827	2520	15805
2540	5749	2560	15416	2580	8891
2600	10333	2620	7483	2640	18111
2660	4061	2680	4521	2700	3694
2720	9921	2740	17391	2760	15520
2780	14422	2800	5862	2820	6934
2840	9550	2860	12304	2880	7861
2900	7041	2920	9218	2940	8205
2960	13589	2980	7068	3000	10583
3020	9930	3040	9643	3060	1709
3080	11394	3100	13340	3120	14425
3140	16034	3160	1864	3180	16490
3200	13065	3220	18309	3240	12693
3260	8743	3280	11894	3300	9907
3320	9881	3340	9855	3360	9829
3380	11892	3400	9755	3420	11053
3440	5759	3460	9791	3480	9595
3500	7873	3520	10529	3540	22304
3560	10724	3580	11048	3600	11948
3620	9987	3640	18983	3660	836
3680	4548	3700	5968	3720	3369
3740	3414	3760	3619	3780	3634
3800	7014	3820	4420	3840	4454
3860	4092	3880	4203	3900	4281
3920	4080	3940	4098	3960	4052
3980	3969	4000	4210	4020	12740
4040	18226	4060	15126	4080	4933
4100	4951	4120	4458	4140	4958
4160	3238	4180	5932	4200	10937
4220	10958	4240	6287	4260	4154
4280	4161	4300	6193	4320	6146
4340	3601	4360	4931	4380	4124
4400	4642	4420	4155	4440	5332
4460	3649	4480	6444	4500	11399
4740	12699	4760	7516	4780	7495
4800	16072	4820	9306	4840	5808
4860	8887	4880	3494	4900	7998
4920	3395	4940	12546	4960	10389
4980	9624	5000	7062	5020	6876
5040	45441	5060	5496	5080	5478
5100	5679	5120	5611	5140	5768
5160	5724	5180	5665	5200	4834
5220	10125	5240	4422	5260	25894
5280	2132	5300	12320	5320	10538
5340	12192	5360	10331	5380	11323
5400	2062	5420	1498	5460	12727
5540	4674	5560	9406	5580	15229
5600	9011	5620	16904	5640	16893
5660	17457	5680	14346	5700	12291
5720	12943	5740	7721	5760	8071
5780	16426	5800	19980	5820	16440
5840	15224	5860	15757	5880	13565
5900	16003	5920	12129	5940	19546
5960	9981	5980	14078	6000	20686
6020	21592	6040	16393	6060	12133
6080	26119	6100	19257	6120	3951
6140	15440	6160	10606	6180	1498

```
4740 POKE 704,12:POKE 559,62:POKE 5325
8,0:POKE 53259,0:POKE 53277,3:RETURN
4760 P$(838,859)=T5$:P$(878,899)=T2$:P
$(920,941)=T4$
4780 P$(596,617)=T1$:P$(637,658)=T3$:P
$(678,697)=T6$
4800 X=123:Y=38:DX=0:DY=0:R=0:L=0:V2=2
:V250=250:V0=0:V21=21:LIFE=3:SCORE=0:L
EVEL=0:BFLAG=0
4820 V50=50:V200=200:V36=36:V1=1:P$(Y,
Y+21)=L1$:RETURN
4840 REM NEW LEVEL
4860 IF LEVEL=10 THEN LEVEL=0:DIF=DIF+
1:LIFE=LIFE+1
4880 IF DIF>8 THEN DIF=8
4900 POKE 77,0:? CHR$(125):FOR COLR=0
TO 15 STEP 2
4920 SETCOLOR 4,COLR,4
4940 POSITION 16,0:? "LEVEL ";LEVEL+1:
POSITION 16,23:? "LEVEL ";LEVEL+1;
4960 SOUND 2,60,10,6:FOR DEL=0 TO 30:N
EXT DEL:SOUND 2,120,10,6
4980 POSITION 16,0:? "          ";:
POSITION 16,23:? "          ";
5000 FOR DEL=0 TO 20:NEXT DEL:NEXT COL
R
5020 SOUND 2,0,0,0:SETCOLOR 4,13,4:RET
URN
5040 REM      MUSIC ROUTINE FROM ATARI
COMPUTING  USR(1536)-MUSIC ON   USR(15
59)-MUSIC OFF
5060 DATA 104,173,36,2,141,77,6,173,37
,2
5080 DATA 141,78,6,162,6,160,36,169,7,
32
5100 DATA 92,228,96,104,174,78,6,172,7
7,6
5120 DATA 169,7,32,92,228,96,206,76,6,
173
5140 DATA 76,6,208,29,172,79,6,200,200
,185
5160 DATA 128,6,201,255,208,2,160,0,14
0,79
5180 DATA 6,185,128,6,141,0,210,185,12
9,6
5200 DATA 141,76,6,76,98,228,0,0,0,0
5220 RESTORE 5060:FOR I=0 TO 79:READ A
:POKE 1536+I,A:NEXT I
5240 POKE 1612,1:POKE 1615,254
5260 SOUND 0,0,0,0:POKE 53761,166:REM
 MUST BE DONE OR YOU WON'T HEAR IT!
5280 MST=1536+128
5300 FOR I=0 TO 105 STEP 2:READ A,B:PO
KE MST+I,A:POKE MST+I+1,B:NEXT I
5320 DATA 81,11,0,11,81,33,64,11,72,11
,81,11,0,1,81,11,91,11,0,1,91,33,72,11
5340 DATA 60,11,91,11,72,11,81,11,0,1,
81,33,64,11,72,11,81,11,0,1,81,11,91,1
1,0,1,91,33
5360 DATA 72,11,60,11,91,11,81,11,0,1,
81,11,0,1,81,5,91,5,96,5,91,5,81,11
5380 DATA 0,1,81,11,64,5,72,5,81,5,72,
5,64,11,0,1,64,11,53,5,60,5,64,5,60,5,
52,23
5400 DATA 255,255
5420 RETURN
5460 POKE 704,226:POKE 53251,0:POKE 53
```



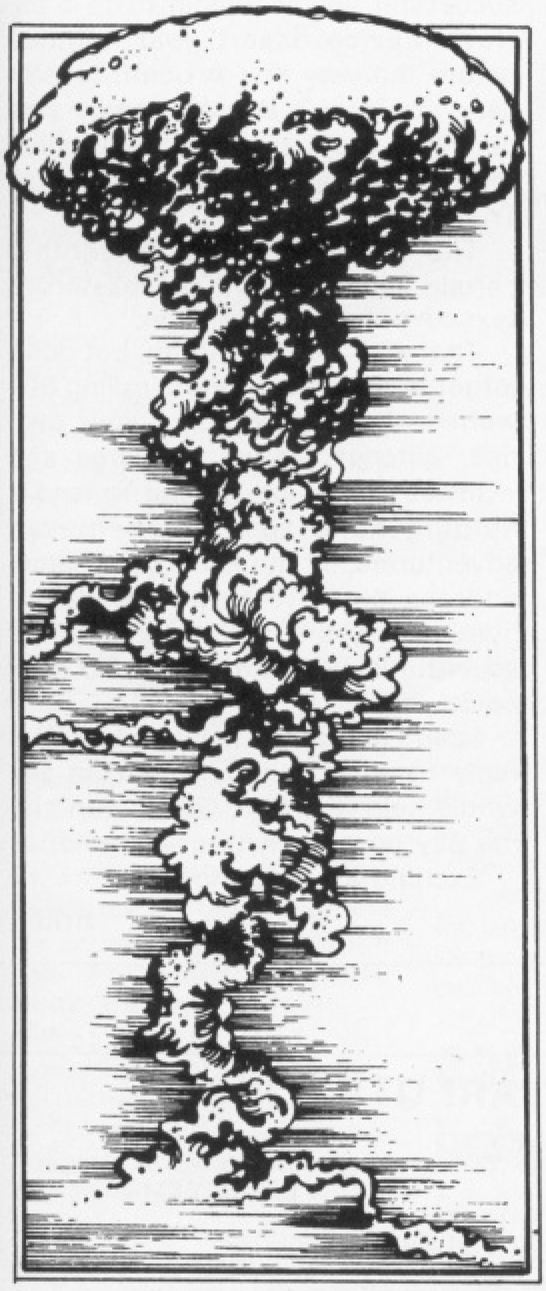
```
250,0:POKE 53248,0:GOSUB 1280:GOSUB 60
80
5540 X=123:GOSUB 4020:RETURN
5560 ? CHR$(125):POKE 82,0:SETCOLOR 2,
0,0:SETCOLOR 1,0,10
5580 POSITION 13,1:? "FENCE  BUILDER":
? :POSITION 13,2:FOR Z=1 TO 14:? CHR$(
```



```
13);:NEXT Z
5600 ? :? :? "   THE  OBJECT OF THE GA
ME IS TO ERECT ":?
5620 ? " FOUR  FENCES. UNFORTUNATELY
THE AREA":? :? " HAS BEEN SUBJECTED  T
O RADIATION FROM":?
5640 ? " THE NEARBY  NUCLEAR POWER  ST
ATION. A":? :? " SIDE  EFFECT OF  WHIC
H IS  THAT  YOUR":?
5660 ? " TOOLS HAVE BEEN ENERGISED AND
 ARE NOW":? :? " ROAMING  ABOUT  UNCON
TROLLED. YOU MAY":?
5680 ? " ALSO  NOTICE THAT IT HAS  CAU
SED THEM":? :? " TO  E X P A N D  ALAR
MINGLY !"
5700 POSITION 5,21:FOR Z=1 TO 10:? CHR
$(13);:NEXT Z:? CHR$(13):RETURN
5720 POKE 82,0:? CHR$(125):POSITION 13
,1:? "FENCE  BUILDER":? :POSITION 13,2
5740 FOR Z=1 TO 13:? CHR$(13);:NEXT Z:
? CHR$(13)
5760 ? "   YOU ARE THE SMALL MAN WHO A
PPEARS AT"
5780 ? " THE TOP OF THE SCREEN. YOU MO
VE HIM BY":? " USING A JOYSTICK IN POR
T ONE. YOU  CAN"
5800 ? " PICK UP THREE POSTS OR FENCE
PIECES BY":? " STANDING  ON THE  OBJEC
T  AND PRESSING":? " THE BUTTON. ":?
5820 ? "   POSITION  YOURSELF  UNDER A
 HOLE AND":? " PRESS BUTTON TO PLACE A
 POST  OR  NEXT"
5840 ? " TO A POST TO ERECT A SECTION
OF  FENC-":? " ING.  THE SPADE MAY BE
USED TO FILL IN"
5860 ? " HOLES. POINTS  ARE  ONLY  AWA
RDED  FOR":? " ERECTING A PIECE  OF  F
ENCE ALTHOUGH A"
5880 ? " BONUS  MAY BE OBTAINED BY COM
PLETING A":? " LEVEL SUCCESFULLY.":?
5900 ? "   IF YOU  ARE  HIT BY THE TOO
LS OR THE":? " TIME LIMIT IS EXCEEDED
YOU WILL LOSE A"
5920 ? " LIFE. IF YOU WALK  INTO  ANYT
HING ELSE":? " YOU WILL REBOUND."
5940 N1$="ANTHONY  ":N2$="ROBERT    "
:N3$="DEBORAH   ":N4$="TONY      ":N5$
="STEPHEN   ":RETURN
5960 REM SKILL SELECTION
5980 GRAPHICS 18:SETCOLOR 0,0,6:SETCOL
OR 2,12,4:SETCOLOR 3,13,10:SETCOLOR 1,
3,4
6000 ? #6;" select difficulty":POSITIO
N 0,4:? #6;"DIFFICULTY 0 EASIEST"
6020 POSITION 0,6:? #6;"DIFFICULTY 4 H
ARDEST":POSITION 0,10:? #6;"PRESS 0-4
TO SELECT"
6040 POKE 764,255:CLOSE #3:OPEN #3,4,0
,"K:":GET #3,R:CLOSE #3:IF R<ASC("0")
OR R>ASC("4") THEN 6040
6060 A$=CHR$(R):DIF=VAL(A$):FEN=4-DIF:
GRAPHICS 0:POKE 756,MEM:RETURN
6080 ? "       PRESS ANY KEY TO CONTIN
UE";:POKE 764,255:OPEN #3,4,0,"K:":GET
 #3,R:CLOSE #3:RETURN
6100 FOR SO=1 TO 5:SOUND 2,20,10,8:FOR
 Z=1 TO 5:NEXT Z:SOUND 2,0,0,0:FOR DEL
=1 TO 10:NEXT DEL:NEXT SO:RETURN
6120 REM PMOVE
6140 RESTORE 6160:FOR W=1 TO 18:READ X
:PMOVE$(W,W)=CHR$(X):NEXT W:PMOVE=ADR(
PMOVE$)
6160 DATA 104,166,203,164,204,202,200,
142,2,208,140,3,208,134,203,132,204,96
6180 RETURN
```

Trinity, a winner from the shadow of the Bomb

By Brillig



AS a result of messing around with a little-known version of a Serendipity spell that I found bat-stained and barely legible in my 1329 edition of The Wizard's Digest Book of Spells, I am now the surprised and delighted owner of a 520 STM.

I couldn't similarly manage to conjure up in my cauldron Infocom's new ST adventure Trinity to go with my new machine (such spells are useless against the likes of the Frobozz Magic Company). However Software Express in Birmingham must be personal friends of Belboz because they immediately arranged a review copy for me.

Trinity will be reviewed in more depth when I've had a chance to get deeper into it, but I thought you might welcome a small foretaste.

Like Mind Forever Voyaging, this is an Interactive Fiction Plus game and so needs 128k of memory – it uses medium resolution mode (80 columns). Once loaded the program rarely needs to access the disc, so response time is very fast indeed.

The adventure, written by Bryan Moriarty of Wishbringer fame, breaks new ground for Infocom, being their first to concentrate on a serious theme, and the first to use actual places and events. Although I certainly wouldn't like to give you the

→

Tips for the Enchanter trilogy

Staying with Infocom for this month, the following is a pot pourri of tips and fun items to try out on the marvellous Enchanter trilogy. It progresses in ascending order of difficulty level and consists of Enchanter (standard), Sorcerer (advanced) and the newly-released Spellbreaker (expert).

The tips have been coded in a very simple fashion so that you won't accidentally read something that might otherwise spoil your enjoyment. Each tip is written backwards, with all spaces and most of the punctuation removed, and presented in blocks of four letters. To decipher, simply read from the right to the left of the tip.

ENCHANTER

1. How can you survive the sacrifice?

- *LLEP SOOM ZOEH TESU TSRI F*
- *YREL LAGE HTNI TIAR TROP DETH GILE HTDN IHEB SITI*

2. Is it possible to take the sacrificial dagger?

- *ECIF RCAS EHTE VIVR USUO YECN OSEY*

3. I can get to the control room in the engine room using the EXEX spell but how do I get back safely?

- *MOOR ENIG NEEH TOTE LTRU TEHT DAEL*
- *MIHX EXE*
- *WNOG NDAL LORC SEKA TESO GOTM IHLL ET*

For fun, try talking to, or befriending the guards in the cell; listening to the guards' conversation while in the cell.

SORCERER

1. How do you win the hawker's game in the Amusement Park?

- *NOIT OPEL BOOF EHTD EENU OY*
- *TROF EHTN ISIT I*
- *TIEN IMAX EDNA GALF EHTR EWOL*
- *LLAB EHTE KAT*
- *NOIT OPEL BOOF EHTK NIRD*
- *SEIN NUBE HTTA LLAB EHTW ORHT*

For fun, try: Sitting on the parrot's perch; leaving the arcade with the ball; asking someone about himself.

SPELLBREAKER

1. How do you get the hermit's cube?

- *TUHE HTYL KSAC*
- *EBUC EHTE KAT*

2. How do you tell one featureless white cube from another?

- *XOBE HTNO NGIS EDEH TTAK OOLD NAXO BEHT NIEN OTUP*
- *NIRU BCIG AMEH THTI WEBU CEHT NO"E MAN" AETI RW*

For fun, try: Smelling the ogre and the orange smoke; sleeping in the ogre's cave; following the rabbit from the meadow.

impression that Trinity is a humourless affair – it certainly isn't – the theme and ultimate objective dictate a less lighthearted approach.

Trinity begins with you, an American tourist, taking the air on a bright sunny day in Kensington Gardens, London. The place is swarming with nannies pushing prams, while on the pond people are sailing their model boats. A little old lady is selling crumbs for feeding to the birds. Nearby a saucy young Cockney lad sits blowing soap bubbles. All very charming, very English.

But one or two incidents portend darker things. One old lady is struggling with her umbrella in the strong wind. When you try to help, you see that her Oriental features have been horribly disfigured by deep red lesions. Sirens go off, and people start scattering. The bird-lady suddenly shrieks "It is time!" and before you realise what is happening, London takes a direct hit from a nuclear bomb. World War III has begun.

Unless you enter another time, another place, another dimension, you have no chance of survival. And that's just for openers. You'll soon find yourself in a world awash with weird creatures, unusual objects and bizarre riddles, where time and space behave unexpectedly.

Your task is to discover the logic behind this strange universe. If successful, you should finish up in the New Mexico desert, just minutes before the very first A bomb test. In case you didn't know, it really was here that the first atomic detonation took place – and the codename was Trinity.

The game looks to be another certain winner from these masters of text adventures. More anon.

That's all for this month, but don't forget to keep your letters rolling in. I want to hear more about your own tips, glitches, news, problems and wrinkles. If you are willing to lend a helping hand to other bemused adventurers, let me know your name, address and preferably telephone number, together with the titles of the adventures you are willing to give advice on.

I can't guarantee to give a personal reply to all your letters, but an sae would help (the Post Office won't let me pay postage with troll's gold!)

Exciting adventuring!

Brillig

GLITCH OF THE MONTH

THIS is not so much a glitch, more a sloppy bit of programming. In Ariolasoft's newly-released Lapis Philosophorum, there's a market where "you can buy anything, from food to cattle". But just you try to BUY FOOD and you'll get the unintentionally contradictory retort, "Nothing like that is here".

APPLYING STR$ TO A VARIABLE

CAN you help me with certain operational aspects of the Atari 800XL?

Firstly is it possible to Apply the STR$ function to a variable? For example:

X=1400:X$=STR$ (X)

If not, is there an alternative method to attain this transposition?

Secondly how are the USR function arguments following the starting address of the machine code routine being called related to the routine itself?

For example, line 1170 of the Player Missile Graphics program in the June 1986 issue of Atari User.

Thirdly how do you implement a flashing cursor or character on screen?

Finally can you get a more detailed memory map to establish exactly which addresses are pokeable, and the system operation to which they are related? – **G.A.R. Body, Surrey.**

● Yes X$=STR$(X) will indeed return a string containing the number you requested.

The USR function arguments are simply a way of passing information from the Basic program into the machine code routine.

They are each pushed onto the 6502 stack in two byte format – low first, high second – so that you pull the low byte off the stack first.

In addition the routine finally pushes the total number of arguments on to the stack, so even if you do not use any parameters you must still remember to PLA the count – zero – off the stack before doing an RTS back to Basic.

Regarding your third query we featured a small routine to give a flashing cursor in our very first issue, but we may well have an even smaller one in the Five-liners series soon.

Finally a very good memory map called Mapping the Atari is available from Compute! Books, which should tell you everything you might want to know and more.

You can get it from most of the large mail order firms if you have any problems locating one locally.

800 XL light pen

I WOULD like to know where you could buy a light pen for the Atari 800XL and how much it would cost. – **Adam Urdon, Ramsgate, Kent.**

● You can get a light pen for your 8 bit Atari from Supertec of Basildon, Essex for £16.50. For that you get the light pen, plus various programs to use with it. Supertec also runs a bulletin board on 0268 293639 for those of you interested in modems. It runs at 300/300 at present, and should have the option of 1200/1200 shortly.

Games in Iceland

WHY are some micro owners in England complaining about software prices? Games costing £10 in the UK cost about £16.50 in Iceland.

If that were not bad enough there are just two retailers in Reykjavik who import Atari games, and they do not stock most of the ones available in the UK.

Fortunately I discovered the mail order service offered by some UK computer shops.

Sunaro Software has been a great help to me, and I can now buy Mastertronic budget games, Boulderdash 2 and many more.

Finally will UK Atari owners please contact me to swap programming tips and so on. – **A.T. Oskarsson, Alfheimar 3, 104 Reykjavik, Iceland.**

● Doesn't *Atari User* travel the world? It seems that we have it made with our cheap £9.99 games.

Perhaps other overseas readers would like to let us know how they fare for software and hardware availability and prices in their neck of the woods? We look forward to hearing from you.

Out of fuel in Space Maze

I HAVE just typed out your Space Maze and on the first board there is a tower, but what is it for?

On Board 2 there is what I think is a fuel station, but I have not been able to get there.

On Board 3 I got through the rocks and landed on what I thought was fuel but was killed.

Could you please tell me how to get fuel? – **Carl Dickin, Preston, Lancs.**

● To refuel all you need to do is hover inside the fuel dump by giving quick bursts on the rockets until you are stationary. The fuel will then load automatically.

Gathering in the £££s

I WAS interested to read your recent letters and replies about the pound sign using Atariwriter and the 1027 printer. However there is a much easier way to produce this.

All you need to do is to turn on the International Character Set at the top of the document by typing:

[CTRL-0]27[CTRL-0]23

on a separate line underneath the print formatting block.

From that point on the pound sign can be summoned up by:

[CTRL-0]8

The trick is not to use the 1027 option when prompted to select the printer. On the disc version select option 1 – the 1025 printer. On the earlier cartridge version select option 3 – the 820 printer.

The only slight drawback is that underlining now has to be achieved by:

[CTRL-0]27[CTRL-0]25

It can be stoppped either by hitting the Return key or by:

[CTRL-0]27[CTRL-0]26

Other international characters can similarly be produced by substituting the relevant number from the 1027 manual.

This letter was printed using this method, to prove the point. – **Phil Rae, Hornsey, London.**

● On that point I think we'd better declare the great *Atari User* 1027 pound sign debate well and truly closed.

Locked-up tape

I HAD the same problem with the Whirlynurds tape as Colin Brunt in June's Mailbag.

It kept locking-up on me and I had to reload. I eventually found out it was a fault in the actual tape.

I wonder whether you are familiar with the robot game Chimera. I have found the spanner and the bolt, and

→

eaten all the bread and drunk all the water.

I have even tried to move every object in sight, but I still cannot open the door. I just knock on it, and it tells me it's a door.

Can you give me a clue on how to open it?

Also it keeps on telling me to find a static object. There are two or three lying about, but they all kill me. – **James Kelly, Settle, Yorkshire.**

● Can anyone help out with James' problems? If so, drop us a line and we'll let everyone know next time.

If anyone else has any questions on other games, or hints and tips that you think other readers may find interesting, why not let us know and we'll run a page of them in a future issue.

Maths programs

I MUST strongly disagree with Alan Coode's review of Software Factory's CSE and GCE O level maths series.

I would like to say that as a school leaver who has just taken CSE maths I found that the series of programs helped a great deal with my revision.

I do not agree with the remark that you have to be well above O level standard to understand the questions.

I am not anywhere near that standard, yet I could understand the questions and the explanations on the Help pages, and did not feel demoralised by them.

I agree that there are not a lot of graphics, but I feel this doesn't matter as it is an educational series and not a game.

He also mentions that there is other existing software available to pupils. Well I could not find any of this standard for Ataris.

I hope that this review will not put people off showing an interest in the series as it is well worth the money. – **N. Sharrock, Kenley, Surrey.**

★★★

I RECENTLY read the review of the CSE and GCE maths programs in your May 1986 issue.

I used these programs while doing a two-year O level maths course, and after reading the review felt I had to comment on several things mentioned by your reviewer.

On the whole I found that the explanations given on the Help pages were clear, and I did not find the questions particularly difficult.

Regarding graphics, although younger children may find them interesting the older pupil like myself does not.

Your reviewer said that the course is no good for those who want to teach themselves, but surely it is not designed for self-teaching. It is for use in conjunction with normal classroom lessons.

And where is all this other exciting maths software? I haven't been able to find any suitable for the Atari. – **M.J. Miller, Streatham, London.**

Vanishing ghosts

COULD you help me with the problem I am having with Maze Munch from your September issue?

On the main screen you can hear the ghosts moving after Horace, but you can't see them at all.

When you move Horace about the score goes up, but then you run into a ghost.

When I checked through the listing I found nothing wrong, and no errors are shown when I run the program. – **Scott Doney, Kent.**

● Check your typing again with the check-sum listing for the game in the March issue.

Television systems

I RECENTLY got an 800XL in England and will be returning to the US in January.

The transformer is obviously 220V and I was wondering if I could buy a 110V transformer when I return?

I assume that the computer is compatible with the Atari systems in the US, along with the software I've bought here. It this correct?

If so, is there any place in the UK where I could get the necessary items needed to use the system once back in the US? – **Jerry Harvey, Newbury, Berks.**

● The answer to all of the questions you ask is yes, but you missed out one important one.

You can indeed run all Atari computer software on UK or US machines with no problems, and you will have no trouble getting a 110V power supply when you get back to the States.

Unfortunately the TV system used in America is not the same as that used in England. We use PAL, and America uses a totally different system called NTSC.

PAL gives a much clearer picture, with more stable colours, which is why we switched to it about 15 years ago.

The two systems are incompatible, and you will not be able to get your PAL system Atari to display a picture on an NTSC television.

This means that you will need to either take a PAL TV set over with you, or perhaps better still sell your old machine before you leave and get a new one which will still run all of your existing software over in the States.

Contact the Atari Helpline for further information.

In the pipeline

I HAVE my heart set on buying an Atari. Unfortunately the ST is out of my price range, so the 8 bit models are the ones I am interested in.

Will any new models be appearing in the near future because obviously I would like the most up-to-date one?

If not, could you tell me if the 130XE is compatible with 800XL and 600XL software, and do you think it's a good buy? – **Mike Hallett, Strathclyde, Scotland.**

● No one really knows what Atari have up their corporate sleeves, so it's a bit difficult to say what 8 bit machines they will dream up next.

A lot of educated guesses are going around regarding a possible 256k XE machine, but that certainly won't be available this year.

Anyway the 130XE is fully compatible with all 600XL and 800XL software, and is indeed a very good buy.

If you don't feel the extra 64k will be of much use to you why not look around for one of the £129 Dixons/Currys packs of an 800XL with a 1050 disc drive?

Sound on tape

I HAVE recently read that the 1010 program datacorder can be used to tape programs and sound simultaneously.

If this is so can you tell me where I could buy a microphone, and how much it would cost? – **Ian Noble, Tyne and Wear.**

● The 1010 – and indeed all of the Atari program recorders – can indeed play music while loading games, as it uses a stereo tape head.

However there is no easy way to record in stereo with the 1010. The only way to do what you are asking would be to connect the output from the Atari on to the right channel of a stereo tape deck, and your microphone on to the left channel.

Pin 5 on the 13 pin I/O connector is the audio data-out, and pins 4 and 6 are ground.

Don't forget to control the pause facility yourself though, as the computer will have no control over when to stop and start the deck.

Incidentally, you can only record this way, not play back. To play back you must use the 1010.

ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

Reading data

I HAVE had an 800XL for about a year now and despite the appalling famine of information issued by Atari I am now endeavouring to write my own programs.

However I am slowly going bonkers over a problem I cannot solve.

I am putting together a filing program using "Read, data" statements and it will not print more than one string entry.

The same one is repeated on every line, yet the numeric data is correct and in sequence for every line. For example:

```
10 READ A$,B,C
20 FOR X=1 TO 10
30 POSITION 3,4:? A$
40 POSITION 9,4:? B
50 POSITION 15,4:? C
60 NEXT X
```

results in only one A$ statement, such as a date, being repeated on every line.

The rest of the program, including the mathematics, works fine. Please help, before the family have me certified. – **E.G. Mitcham, Solihull, West Midlands.**

● In the program as you've described it the reason you only get one string printed is that you have only READ one string.

If you put the READ A$,B,C line inside the FOR . . . NEXT loop, you'll get 10 different values.

As it is the loop doesn't have any way to alter the value of any of the three variables, so it prints out the same results 10 times.

Disc drive commended

I WISH to compliment the excellent new 1mb disc drive from Cumana for the ST.

Actually I object to the description of any of these drives being 1mb, as their useful capacity is only 720k – which is impressive in itself – so why attempt to mislead the non-expert consumer?

Having got one of the Cumana drives a month ago I can report that it operates as fast as the standard Atari drive.

It has all the same characteristics, but is very much quieter – almost silent in fact – and costs £55 less as well – I bought mine from a dealer for £154.

Another advantage is that the unit has a built-in power supply, and is mounted in a very neat grey package which suits the ST very well and measures only 2 x 4 x 9in.

I was slightly sceptical at buying a device for which I had read no reviews, but can definitely recommend this one to you. – **C.S. Franks, Southampton.**

Miserable manuals

AS an 800XL owner of some three months I am sure I am not alone in decrying the abysmal manuals supplied with an otherwise excellent machine.

Apart from religiously buying Atari User each month I have found it difficult to get useful literature.

I have finally managed to obtain a copy of Mapping the Atari but, still being very much a learner, find it rather heavy going.

I would think that with over 100,000 XLs sold over the 1985/86 Xmas period there would be a great demand for an in-depth monthly programming tutor, starting at the bottom and working up. – **Rich Robinson, Stellow, Doncaster.**

Circular solution

I OWN an 800XL and am doing a program for my O Levels which involves circles.

Could you tell me if it is possible to draw circles on the 800XL? – **G.P. Lees, Staffs, England.**

● There is no function in Atari Basic for drawing circles, but you can write a program to draw them yourself quite easily.

The following subroutine will draw one for you.

```
1000 COLOR 1:PLOT X,Y+YR
1010 DEG :FOR ANG=0 TO 360 STEP 5
1020 DRAWTO SIN(ANG)*XR+X,COS(ANG)*YR+Y
1030 NEXT ANG
1040 RETURN
```

To use it simply set X and Y to the centre coordinates of your circle; XR and YR to the radius, then GOSUB 1000.

You may set XR and YR to different values if you want an ellipse rather than a circle.

If you increase the STEP value 5 in line 1010 you can create polygons instead of circles.

Divide 360 by the number of sides you require to get the STEP value, for example, if you want five sides use a value of 72.

WP on the 800 XL

SINCE its launch I have noted several queries in Mailbag concerning word processing on the 8 bit machines.

I bought the 800XL, 1050 disc drive and 1027 printer from Dixons over a year ago in a package which included Atariwriter.

Earlier this year I decided to upgrade and, while visiting relatives in the US, managed to pick up a copy of PaperClip for the 800XL/130XE at an exceptionally low price of $43 – why is it £59 here?.

What outstanding value. It seems to do everything, including all the usual functions plus double column printing, italics, double strike, boldface and hanging indent.

It comes with approximately 30 printer drivers which cover most popular models, and it also has a program which allows you to write your own.

The problem is that the poor old 1027 can't begin to match all this additional capability, so I started looking for an alternative.

After looking around I finally settled on the Star SG-10 from Digitask Business Systems and, after nearly six months of fairly heavy use, I'm very pleased with it.

Of course I also had to buy an interface – from Chips Computer Centre – and a printer cable from Silica Shop.

I ordered the necessary items by telephone and within three days everything arrived. I'm very grateful to all three suppliers for an outstanding service.

I would like to elaborate a bit – pun intended – on the SG-10.

It comes complete with

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friction and tractor feed, external dip switches, a comprehensive user manual, and the NLQ mode – software/dip switch controlled – which is exceptionally good.

In the near future I want to upgrade my system even more with the 130XE, another disc drive, monitor and daisywheel printer. If anyone would like additional information I would be glad to help.

I would also like to hear from anyone using a different interface – good or bad – and/or daisywheel printers.

I'm especially interested in the Juki 2200 typewriter/printer and FCC Systems' centronics interface. – **Andrew P. Sellers, 15 Holme Close, Marston, Moretaine, Bedford, MK43 0PT.**

Cable? No problem!

I REFER to the letters in the June edition of Atari User about monitors. You did not answer Mr Bishop's first question about the Ferguson MC05 and the degree of resolution it could deliver with the ST.

What I can offer is the assurance that it gives a super clear and rock-steady picture with my 800XL. This may be some help to Mr Bishop and will certainly be of help to any 8 bit users who are considering whether to buy a monitor, especially when they read what follows.

The letter from Mr Fallaize complained about the attitude displayed by Sony toward his enquiry about a cable to use linking their KX-14CP1 monitor with his computer.

Let me tell you what happened when I bought my Ferguson.

Having decided I liked the look of the MC05 I had asked someone to make me a cable to link it to my 800XL.

However when I got the set home I found an unassuming little card inside promising to supply a cable to link the MC05 to any computer. About six popular models were mentioned, but Atari was not one of them.

I duly telephoned Thorn EMI Ferguson who at once said that their offer did indeed stretch to Ataris.

So that Thursday night I filled in the post paid card and sent it off. On the Saturday morning I got my cable, connected it to the CV socket and it worked perfectly.

The cost to me? Nothing, except the telephone call which was not in fact necessary. Now THAT'S what I call service!

Incidentally, I also have a super small TV in the same piece of equipment. So take my advice, get an MC05 for your Atari. – **George Walker, Littlehampton, West Sussex.**

WHERE can I get a connecting lead to connect an 800XL T and a Grundig TV monitor. – **P. Harding, Rothwell, Leeds.**

● Try Silica Shop or Software Express or a local dealer with an engineer.

Basic time piece

IN the February issue you published a program for a digital clock, I have tried to use this, but it is inaccurate.

I wanted to incorporate it into a program that I have written and found that in two hours 15 minutes running, the clock is 24 seconds out.

I assume that it is possible to make it more accurate and would be very grateful if you could advise me how. – **M.J. Hake, Earls Croome, Worcester.**

● In this month's Five-Liners you'll find this very subject tackled.

The problem is that the screen refresh is just a fraction under 50 times a second, and so the clock program drifts by a few seconds per hour.

Unfortunately, since the program in the February issue is written in machine code, it is a little tricky to divide by 49.85866.

So unless you have a fair knowledge of machine code your best answer would be to work with the Basic version Len Golding describes in this issue.

Interface interest

I AM delighted to see your latest set of articles on some of the interfacing applications of the Atari 800XL and look forward to the following ones with keen interest.

I am a flight simulator technician and perhaps take an extra interest in the more practical applications that the Atari is capable of.

The problem is that trying to obtain any technical information about, for instance, the 800XL circuit diagrams and peripheral interfacing requirements is almost impossible.

Could I use a normal cassette recorder instead of a designated one? Until I find out the pin-out to the cassette recorder I'm stuck. – **K. Horsted, Wadebridge, Cornwall.**

● The best source of technical information on the workings of both the operating system and the hardware ports on the Atari machines is the Technical Reference Notes, available from most Atari dealers.

These also include the circuit diagrams and OS listings for the 400/800, which are not applicable in your case, but the rest of the book is worth its weight in gold.

As to your other question the Atari cassette system uses an FSK decoding circuit in the recorder itself, so you can't just hook up an ordinary domestic recorder.

However there are companies which make converters. Contact one of our advertisers for more details.

Device timeouts

IN your Get-It-Right! program why did I get an error message of device timeout on line 7000?

Also I typed Space Maze

Better colour reproduction

I OWN an 800XL, 1050 printer, monochrome monitor and some good programs.

My only problem is that my XL is an American model which means no colour, and being NTSC 3.5 it is incompatible with our Secam system.

Would a European colour composite video monitor work?

Monochrome is fine with word processing, but graphics and games lose a lot without colour.

Can you please help? – **J.M.D. Mantheakis, Athens, Greece.**

● As you have by now discovered the NTSC television system used in the States is quite incompatible with either the UK's Pal system, or the French Secam which your local TV network uses.

Unfortunately the same applies to composite video monitors, and a Secam monitor will not work with an NTSC computer – or vice versa.

That said, if you want to spend just a little bit more you could get a multi-standard monitor which will work with all three systems.

Both JVC and Sony make these and a local TV dealer should be able to advise you on price.

from the August Atari User *and when I ran it it stopped on line 10.*

It took me 12 hours to type in, and it is driving me batty trying to work it out. Could you please help? – **Philip Worrall, Little Sutton, Wirral.**

● Line 7000 of Get-It-Right! opens an output channel to the printer to allow a hard copy version of the checksum to be printed.

A device timeout is the Atari's way of telling you that it allowed the printer a given amount of time to respond to the OPEN command, and that time limit expired with no reply from the printer.

Check that the printer is properly connected, and that it is on-line and has a stock of paper.

If you're using an 850 interface also check that works OK.

To test the printer try typing LPRINT "HELLO" and you should get HELLO printed out on paper. If not you may have a faulty printer or interface.

Once you've got this problem sorted out you can run the checksum on Space Maze and find out where your typing mistake is. From the information you've given it's difficult to say where the error is, but Get-It-Right! will tell you.

Recovering disc's contents

COULD you help me with a problem concerning a few programs I have written?

I saved them to disc like I normally do, but when I tried to retrieve one, Error 164 appeared and DOS wouldn't load in.

I have checked the programs are still there by loading in DOS off another disc then inserting this disc, and they seem to be there.

I looked up ERROR 164 and it says "File Number Mismatch".

What does this mean and how do I overcome the problem of retrieving my programs? – **J. Weston, Bolton.**

● What has happened is that you've somehow managed to scramble the disc's contents list. This was probably due to your removing the disc while the drive was still trying to write to it.

The drive has actually overwritten some of the file contents, and these can not be recovered.

You may be able to recover some of the files by formatting a new disc, writing DOS files to it, and then trying to copy each file in turn from the corrupt disc to your new one.

Do not, under any circumstances, attempt to write to the old disc until you've recovered what files you can and then reformatted it. If you do you'll just get into a worse mess.

Dutch contact

I LIVE in The Hague, Holland, and have an Atari 800XL and 1050 disc drive. Could you put me in touch with any other Atari Users in the UK. – **Rob Rachota, vd. Boschstraat 251, 25g5 AC The Hague, Netherlands.**

Esmerelda error

I HAVE an 800XL. Could you please help me re Atari User *January 1986 game Don't get the Hump – Rescue Esmerelda. When I run the tape with a 1010 program recorder I get an error code 8 (input statement error) on line 9590:*

9590 FOR Q=0 TO 7:READ V:POKE BA+Q,V:NEXT Q – **R.T. Moorse, Park North, Swindon.**

● You will almost certainly find that your problem is a mistyped number between lines 9700 and 9723.

The READ statement gets its data from here, so if there are any mistakes in the data they will be thrown up when line 9590 attempts to find them.

Revision B bugs

ON reading in the July Mailbag "Check your micro – Rev C" I put my 800XL to the test and came up with 96.

I immediately contacted the rest of the family who between them have five 800XLs and found that three are Rev Cs and my brothers and mine are Rev Bs – both computers being bought at Boots.

Further investigation revealed that the Rev Bs would not accept programs that the Rev Cs would accept, even after program alterations.

Also, on long programs Rev Bs repeatedly displayed errors with eventual keyboard lock-up.

We then contacted the manager of Boots as suggested in Mailbag. His technical department was informed by Atari that the articles in your magazine were incorrect and as far as they were concerned there is no difference in either computer.

If this is true could you tell us why R. Gear went to the trouble of working out Rambas for a problem that Atari says does not exist?

Unfortunately for us Boots will do nothing until the disagreement between your articles and Atari is resolved.

Can you please clarify the situation? – **R.J. Helson, Yelverton, Devon.**

● To set your mind at rest, there ARE bugs in Revision B Basic on the 800XL – we aren't talking through our hats.

We have spoken to an Atari representative about this problem, and he assures us that if your machine is genuinely faulty and was bought recently it will be exchanged via your dealer.

If you go into a shop and say: "This machine is Revision B, and I want Revision C", they might quite understandably be reluctant to assist you without checking further.

Your best approach is to explain that the machine crashes frequently, and that you'd like it repaired or exchanged.

If it is out of guarantee period, Atari will provide you with un update cartridge at nominal cost to convert to Revision C.

Why no cassettes?

MY C64-owning friend asks me: "Why don't you buy some Ariolasoft/Broderbund titles like Karateka and Racing Destruction Set for your 800XL".

So I pay a visit to the local Atari stockist only to be told they are only available on disc.

I've seen both these titles on C64 cassette, and my friend says they are also available on disc. So why hasn't Ariolasoft put these titles on cassette in its Atari range?

The 800XL has got 64k, like the C64 hasn't it? – **Richard Martin, Penzance, Cornwall.**

PS: Is Raid Over Moscow available on Atari cassette?

● There are several good reasons why games which come on tape on the Commodore 64 sometimes only come on disc for the Atari.

The first and most obvious is the fact that without the turbo loaders available on the Commodore, such tape games would otherwise take 15 to 20 minutes to load, and many companies find this unacceptable.

There is no practical way of designing a turbo loader for the Atari without modifying the hardware, so at present

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we're stuck with 600 baud tapes.

Also, to work on all Atari machines including the old 800, the games must be limited to 47k at a time, whereas Commodore 64 games can use up to 62k.

This means that the Atari versions of very large games normally need to re-load from the disc after each level or stage is complete.

Raid Over Moscow should be available for the Atari on disc and tape by the time you read this.

Off at a tangent

THE tangent function on my 800XL doesn't work. I have tried everything but I just get an ERROR 9. Since one of my hobbies is astronomy this function is critical. Could you tell me how this can be overcome?

Since I cannot obtain the back issues for the checksum listings and cannot afford to buy the cassette could you please let me know if I can obtain a separate listing? – **S.G. Pass, Thornaby-on-Tees, Cleveland.**

● The reason you are having trouble using the tangent function is that, like many other home computers, the Atari does not have one!

When you type TAN(X), the computer tries to find an array called TAN and the ERROR 9 simply indicates that it couldn't.

However, as any mathematician will tell you, tangent is simply a function of sine over cosine. If you want TAN(X), all you need do is ask for SIN(X)/COS(X).

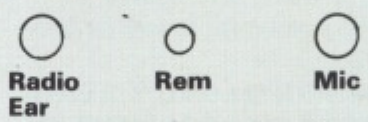
Don't forget that there isn't a valid tangent of a 90 degree angle. Looked at as sine over cosine, it's obvious why – COS(90) gives zero, and you can't divide by zero.

As to the checksum, we hope you found last issue's reprint useful.

Recorder connection

CAN you help? My 800XL has a disc drive, but I wish to connect my Hitachi data recorder to the disc drive I/O, cassette games being cheaper than disc. Or, for that matter directly to the computer.

My main problem is that the D plug has 13 pins and my data recorder has three sockets like this:



Any help will be gratefully received. Many thanks in advance for any help you can give on this matter. – **J.G. Evans, Cheltenham.**

● Unfortunately there is no way to connect an ordinary tape recorder to the Atari directly. The computer I/O uses a special form of coded data called FSK which a normal recorder cannot reproduce.

However you have two choices. There are a number of small devices which will convert the signal from the recorder into a form the computer will understand (starting at about £20).

Alternatively you could buy an Atari data recorder such as the 1010, which is really your best option as that will allow the audio track to work correctly.

If you do use a normal recorder make sure that it is stero, not mono, for this same reason.

Now it's all circuits at GO...

Part 4 of LEN GOLDING's series on using your Atari to control devices. We're ready now to tame the mains

HAVING covered the theory behind a two-channel mains controller it's now time to fix all the bits and pieces together.

Don't be put off if you've never done any electronics construction before – we're using a commercially made printed circuit board, so all you have to do is plug the various components in and solder them correctly. The more ambitious among you can always try etching your own PCB from the template we printed in the last issue.

Before you do anything else lay the PCB on a piece of strong paper and mark the outline and fixing holes. This will be used as a template when you come to drill the case, saving a great deal of measurement.

You will need a soldering iron rated at between 15 and 25 watts, with a 1mm to 3mm bit. Anything larger will be too hot or too cumbersome for use on delicate components.

It's also worth buying the special thin – 22 swg – solder, as this is much more likely to go where you want it without forming untidy blobs. A damp sponge is useful for wiping excess solder from the bit.

Make sure all of your materials are scrupulously clean, as dirt and grease will stop the solder adhering correctly. Hold the soldering iron bit in contact with the component lead and PCB track simultaneously.

Melt a small quantity of solder by touching it to the lead and track – not the iron – and keep the heat applied until you see the solder flow evenly on to the track and around the lead.

Remember that small components can be damaged by excessive heat, so don't hold the soldering iron in contact for any longer than necessary, and allow the component to cool down again after soldering each lead.

With transistors it's best to solder one lead then turn the board over and make sure the case is vertical before doing the other two.

For extra safety you could attach a temporary heat sink to the components while soldering – a small bulldog type paper clip works quite well.

Figure I shows the layout of components on the printed circuit board. Start by fitting the resistors, diodes and transistors, followed by the IC socket, terminal blocks, jack sockets and wire link, then the relays, C1 and transformer.

Don't fit the fuse holders C2 and C3 at this stage, since these will become live during normal use and it's safer to keep mains voltages on the PCB's underside during initial testing.

The resistors may be wired either way round, but the remaining components must be fitted as shown. Diodes have a black or coloured band at their cathode – or negative – end, the bridge rectifier has + marked and the transistors have a small metal tag nearest their emitters.

The capacitor has a wide grey band printed with chevrons and the number 0 to indicate its negative side.

```
10 POKE 54018,56:REM notify prospectiv
e change
20 POKE 54016,255:REM set up all joyst
ick pins for output
30 POKE 54018,60:REM lock new system i
n place
40 POKE 54016,0:REM turn all pins off
50 INPUT N:POKE 54016,N:GOTO 50
```

Program I

The transformer will only fit one way round, but 240V and 9V are marked on the board for extra safety.

Prepare the joystick extension cable by cutting off the unwanted socket, stripping back about three inches of the outer insulation and baring half an inch of each wire.

Use some kind of continuity tester – a small bulb and battery will do – to find which lead goes to which pin, bearing in mind that cables, even from the same source, may vary in the colours they use.

Now it's time for the preliminary testing. There are three separate stages to the circuit – see last month's diagram – and we can check each one in turn.

Leave the opto isolator out of its socket for the moment, and don't connect the mains. Temporarily fit the joystick wires to their PCB terminals and plug the lead into joystick port 1.

Run Program I and hold the test LED across pins 1 and 2 of the IC socket, with its cathode – shorter lead – to pin 2. It should light when you type 1 and turn off when you type 0. Do the same with pins 3 and 4 – cathode to pin 3 – this time typing 2 and 0.

If either is at fault, turn the board

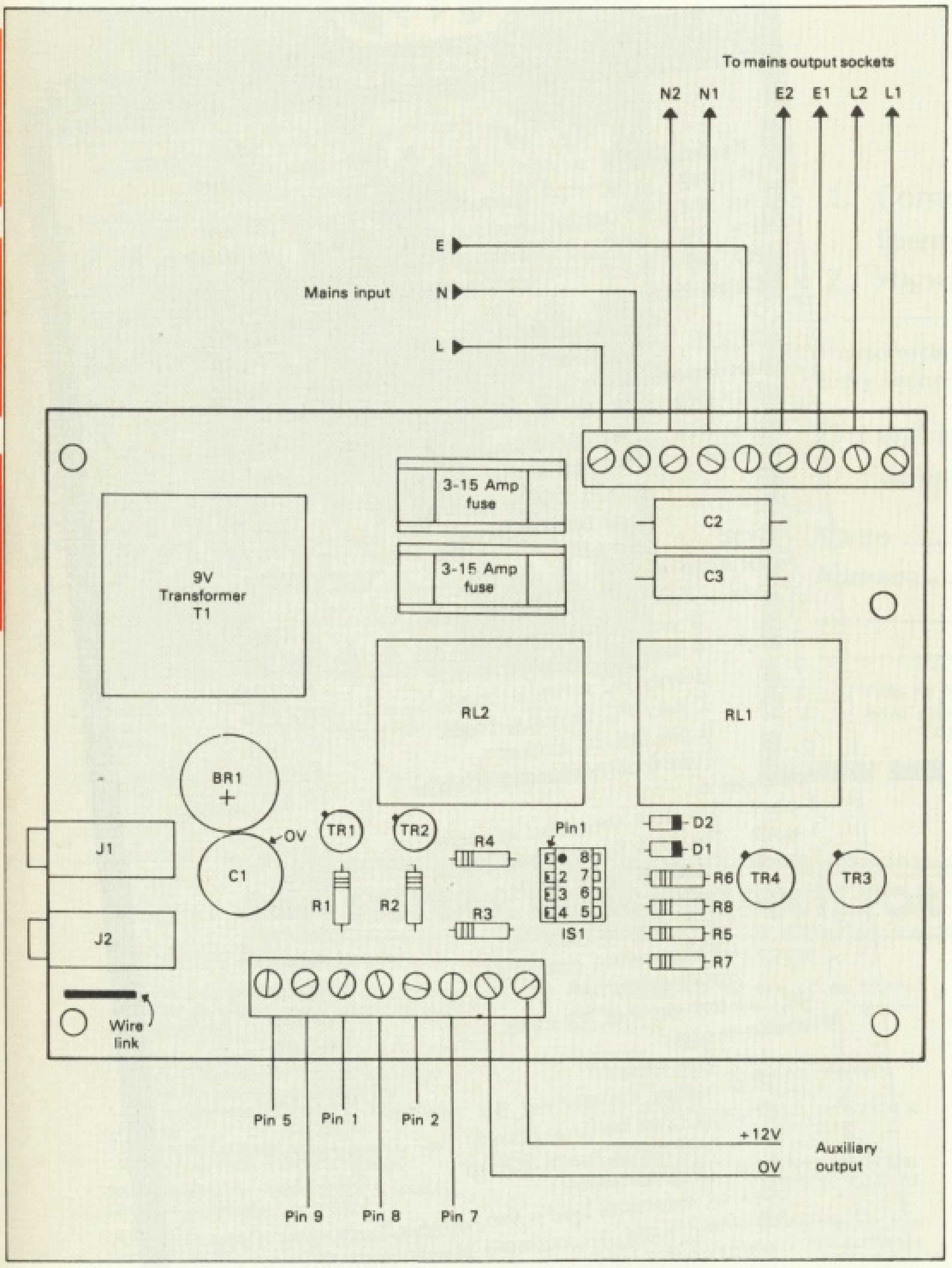


Figure I: Component layout on the PCB for the mains controller

over and make sure you haven't left any connections unsoldered. Also look for dry joints which have a dull, crumbly appearance, and for blobs of solder which have either adhered to the component lead and not the track, or have bridged across two tracks.

Remake any joints that look suspicious. When the first test works satisfactorily it means that stage 1 is correct.

Now check again to see that all polarised components – especially the two diodes – are fitted the right way round. Correct polarities are marked on the PCB, and if you get any of them wrong the component will self-destruct.

Fix the PCB temporarily to a piece of scrap wood or ply using No. 4 woodscrews. This will hold it firmly when the mains is connected, and reduces the risk of your touching a live track.

Wire up the mains supply, taking great care from now on because some of the tracks and the screw heads on the mains terminal block will be live. If everything is wired correctly all the other components will be safe to touch.

With a small screwdriver or a piece of thin wire bridge across pins 5 and 6 on the IC socket. The right hand relay should operate with an audible click. Do the same with pins 7 and 8, and the left hand relay should work.

If not, disconnect the mains and check all the tracks, joints and polarities again. Especially make sure that the two diodes are connected the correct way round – cathode to OV – and replace them if you got it wrong.

When all is well insert the opto isolator, making sure that the small dot on its case is closest to the pin 1 position, and plug the joystick lead into port 1. Check that the relays operate correctly when you type 1, 2 or 0.

Finally disconnect the mains and joystick leads, then fit the two fuseholders along with C2 and C3.

REMEMBER THAT THE METAL PARTS OF THESE COMPONENTS WILL BECOME LIVE WHEN YOU NEXT CONNECT THE MAINS SUPPLY.

That's the electronics part finished. It only remains to prepare a suitable case – preferably all plastic – and connect the various inputs and outputs. If you have to use a box with metal panels make sure that all exposed metal is properly earthed.

It's difficult to mark accurate positions for holes and cut outs directly on to a case, so make paper templates and stick them in place using Copydex. They will peel off cleanly when you've finished drilling and cutting.

The mains cable and joystick lead should be run through rubber grommets to prevent chafing, and they will each need some form of cable clamp to take the strain if they are accidentally jerked during use.

Mains appliances can be wired directly to the terminal block, but it's more versatile to use some form of mains plug and socket. Standard 13A wall sockets will work, but Euro style 6A mains connectors are smaller, neater and cheaper.

The PCB is fixed using internally threaded spacers, so you can have a

→

bolt at each end instead of fiddling with spacer, nut and bolt assemblies.

Attach the spacers to the PCB with $\frac{1}{4}$in 6BA metal bolts, but use nylon bolts through the case to ensure that the exposed heads cannot become live under any circumstances. You may need to shorten each nylon bolt using a sharp craft knife.

Wire the mains cable and joystick lead into their respective terminal blocks and secure them with cable clips.

Fit the mains sockets' Neutral and Earth leads to the PCB terminals marked N and E, and the live leads to the two marked outputs. Then assemble the case and plug in.

The software is easy – just use the first line of Program II to set everything up, then POKE 54016 with 1 to operate relay one, 2 to operate relay two, 3 to operate both together or 0 to turn them both off.

Program II is a simple on/off flasher routine, and Program III is an equally simple delay switch. For some ideas on more complex timing operations have a look at this month's Five-Liner's on Page 48.

You can plug external sensors into the jack sockets – try the cadmium sulphide cell we used in the first article of the series with Program IV to switch a table lamp on when it gets dark and off again when it is light.

These jacks can supply 5V at about 30mA – total – provided nothing else is drawing current from this or any other joystick port. If you need more power, you can draw a nominal 12V at around 300mA from the terminals marked 12V DC and OV on the PCB, but remember this is an unstabilised supply and will vary from about 14V to 12V, depending on the load.

Details of how you can modify the gadget to handle greater loads and more channels were given last month.

● *Next month we'll be turning our attention to inputs, with constructional details for a plug-in numeric keypad.*

```
10 POKE 54018,56:POKE 54016,255:POKE 5
4018,60:POKE 54016,0
20 X=0
30 X=X+(X=0)-(X=1):POKE 54016,X
40 FOR W=1 TO 300:NEXT W:GOTO 30
```

Program II

PARTS LIST

			Maplin order codes
Resistors:			
R1, R2	10K	(brown/black/orange)	M10K
R3, R4	470ohm	(yellow/violet/brown)	M390R
R5, R6	47K	(yellow/violet/orange)	M47K
R7, R8	2.2K	(red/red/red)	M2K2
Capacitors:			
C1	470mfd 25V PC electrolytic		FF16S
C2, C3	0.047mfd 250V AC suppressors		FF55K
Semiconductors:			
TR1, TR2	BC108 transistors		QB32K
TR3, TR4	2N2905 transistors		QR17T
D1, D2	1N4148 signal diodes		QL80B
BR1	W005 bridge rectifier		QL37S
IS1	Dual opto isolator		YY62S
D(test)	Red LED		WL32K (see text)
Connectors:			
J1, J2	3.5mm PCB jack sockets		FK02C (optional)
1	8 way PC terminal block		RK38R
1	4 way PC terminal block		RK73Q
1	3 way PC terminal block		RK72P
1	2 way PC terminal block		FT38R
1	8 pin DIL IC socket		FJ63T
2	Euro facility chassis sockets		HL42V (optional)
Hardware:			
1 pack	$\frac{1}{2}$in 6BA threaded spacers		LR72P
1 pack	$\frac{1}{4}$in 6BA round-head bolts		BF05F
1 pack	$\frac{1}{2}$in 6BA nylon bolts		BF75S
1	Cable clip 3/16in		LR44X
1	Cable clip 5/16in		LR46A
1	Cable-sealing grommet		LR51F
1	Small grommet		FW59P
1 set	Stick-on feet for case		FW38R (optional)
Miscellaneous:			
2	12V Flat relays		HY20W
1	PCB mains transformer 9V		YJ53H
2	Chassis fuse holders 20mm		RX49D
2	3.15 anti-surge fuses 20mm		RA11M
1	Pack 22SWG solder		FR21X
1	Joystick extension lead – for example Tandy 276 1978		
1	All-plastic case, for example Maplin ABS box 2006 – order code LH62S, or ABS box MB4 – order code LH23A.		

```
10 POKE 54018,56:POKE 54016,255:POKE 5
4018,60:POKE 54016,0
20 PRINT "INPUT TIME DELAY":INPUT D
30 FOR W=1 TO D:NEXT W
40 POKE 54016,1
```

Program III

```
10 POKE 54018,56:POKE 54016,255:POKE 5
4018,60:POKE 54016,0
20 IF PEEK(624)>10 THEN POKE 54016,1:G
OTO 20
30 POKE 54016,0:GOTO 20
```

Program IV

Printed circuit board – order code DBP1 – available from: R.H. Design, 137 Stonefall Avenue, Harrogate, North Yorks. Tel: 0423 508359. Price £3.95 inc. postage.
Joystick extension lead available from Tandy stores or large computer shops. Price around £3.50.
Other components available from: Maplin Electronic Supplies Ltd, PO Box 3, Rayleigh, Essex SS6 8LR. Tel: 0702 552911. Approximate cost £18 plus case.

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Clock on for some bright new ideas

ELECTRONIC watches are cheap and accurate, so it might seem a bit pointless to turn your expensive computer into a digital clock.

But if your program can measure hours, minutes and seconds it can also influence events in real time, and this opens up all sorts of new possibilities.

You might, for example, want to set a maximum number of hours and minutes for your user to complete a game, or measure how long it takes to solve a problem, or disable the processor when it's time for the kids to go to bed.

If you build the relay box described in this issue you could use a digital clock program to switch electrical appliances on or off at set times during the day.

Alternatively, you could write a countdown program to operate your photographic enlarger, switch off your lawn sprinkler, launch your space shuttle or whatever. So here's how to do it.

Three addresses – 18, 19 and 20 – are set aside by the operating system for use as an elapsed time counter. Atari call the three registers a real-time clock, but that's a bit misleading because it doesn't measure hours, minutes and seconds. Instead these locations count vertical blank periods – 50 per second – up to a maximum of 16,777,215. To see a clock register in action, try this:

10 PRINT PEEK(20):GOTO 10

You will see the count go up to 255, then reset to 0 and start again. All three of the clock registers work in similar fashion, but they are cascaded together so that address 19 is incremented whenever 20 overflows and returns to 0, and 18 increments whenever 19 resets.

Since the registers are updated 50 times a second it should be relatively easy to convert their values into seconds, then minutes and hours. Program I looks promising, and works reasonably well for short time delays.

Unfortunately, the update rate is more like 49.8 times per second, so this program is about 0.3 per cent inaccurate. For intervals up to a few minutes the difference is hardly worth bothering about, but it mounts up over longer periods, and certainly isn't precise enough to run a digital clock.

The strategy used in Program II is rather different. Here we combine the values from all three registers, then divide by 49.85866 to get the number of seconds which have elapsed since starting the clock. The result is added to the original start time, to get current time, then converted back into hours, minutes and seconds.

Since this method operates on much larger numbers than Program I, any minor errors in division tend to disappear, and the clock is accurate to within two or three seconds a day. The display may appear to hiccup occasionally as it corrects itself to the nearest second, but this is a small price to pay for accuracy.

Line 10 sets up the strings and asks for the start time in hours, minutes and seconds. The clock starts as soon as the Return key is pressed. Line 20 zeros all three registers, converts the start time into its component number of seconds and selects Graphics 2 for the display.

Line 30 reads the three registers, works out how many seconds have elapsed since the clock started then adds this value (ET) to the start time (ST) to get the current time (CT). This is converted back into hours (H), minutes (M) and seconds (S).

The rest of Program II simply displays these hours, minutes and seconds, with leading zeros when appropriate. T$ holds the clock display, and it is initialised to 00:00:00. The numeric values for hours, minutes and seconds are then converted into string form (H$, M$ and C$), using the STR$ function.

Line 50 uses a variant of the normal technique for joining strings together, and ensures that each substring appears at its correct position in the display, regardless of whether it has one character or two.

Now a clock which just sits there ticking away to itself is not particularly inspiring (even if you can get it into five lines of Basic), so the next step is to make it initiate some action when a pre-set time is reached. One way is to delete the GOTO 30 in line 50, and add a few extra lines like this:

```
60 IF H$="10" AND M$="30"
   AND S$="0" THEN GOSUB
   100
70 GOTO 30
100 POKE 54016,1:RETURN
```

Used in conjunction with the mains control box, this will switch an electrical appliance on at precisely 10.30am. The clock display may

```
10 PRINT CHR$(125):PRINT "INPUT NUMBER
 OF SECONDS DELAY"
20 INPUT S:POKE 20,0:POKE 752,1
30 IF PEEK(20)<50 THEN 30
40 POKE 20,0:S=S-1:POSITION 2,5:? S;"
":IF S>0 THEN 30
50 PRINT "TIME'S UP"
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	10412	20	5232	30	3880
40	9286	50	3242		

```
10 DIM T$(8),H$(2),M$(2),S$(2):? "SET
HOURS,MINUTES,SECONDS":INPUT H1,M1,S1
20 POKE 20,0:POKE 19,0:POKE 18,0:ST=H1
*3600+M1*60+S1:GRAPHICS 2
30 ET=INT((PEEK(18)*65536+PEEK(19)*256
+PEEK(20))/49.85866):CT=ST+ET:H=INT(CT
/3600):CT=CT-H*3600:M=INT(CT/60)
40 S=CT-M*60:H=H*(H<24):T$="00:00:00":
H$=STR$(H):M$=STR$(M):S$=STR$(S)
50 T$(2+1-LEN(H$),2)=H$:T$(5+1-LEN(M$)
,5)=M$:T$(8+1-LEN(S$),8)=S$:POSITION 6
,4:? #6;T$:GOTO 30
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	13122	20	10913	30	18633
40	11515	50	15185		

freeze temporarily if your routine is lengthy, but it will correct itself as soon as the extra code has been processed. There is no limit to the number of events which can be controlled, or the times of the day at which they are triggered.

In some circumstances you may prefer to have a countdown timer rather than a real time clock, and Program III shows the modifications needed. The first three lines are identical to Program II, except for the second statement in line 30, where CT=ST+ET is changed to CT=ST–ET.

Some of line 50 is squeezed into line 40 to make room for a new Boolean statement which acts as an IF ... THEN ... ELSE command, normally looping back to line 30 but branching to 100 when the pre-set time has elapsed.

Insert the delay time you require – anywhere up to 23:59:59 – then press Return to start the countdown. When it reaches 00:00:00 the clock stops, the display freezes, and control passes to line 100.

This is less versatile than a real time clock, since only one delay interval can be set at a time, but a countdown carries more visual impact and is often easier to use.

All of these routines can be incorporated into your own programs, so there is really no limit to what your computer can time for you.

Len Golding

```
10 DIM T$(8),H$(2),M$(2),S$(2):? "SET
HOURS,MINUTES,SECONDS":INPUT H1,M1,S1
20 POKE 20,0:POKE 19,0:POKE 18,0:ST=H1
*3600+M1*60+S1:GRAPHICS 2
30 ET=INT((PEEK(18)*65536+PEEK(19)*256
+PEEK(20))/49.85866):CT=ST-ET:H=INT(CT
/3600):CT=CT-H*3600:M=INT(CT/60)
40 S=CT-M*60:H=H*(H<24):T$="00:00:00":
H$=STR$(H):M$=STR$(M):S$=STR$(S):T$(2+
1-LEN(H$),2)=H$:T$(5+1-LEN(M$),5)=M$
50 T$(8+1-LEN(S$),8)=S$:POSITION 6,4:?
 #6;T$:GOTO 30+70*(H$="0" AND M$="0" A
ND S$="0")
100 PRINT "TIME'S UP"
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	13122	20	10913	30	18644
40	18500	50	14069	100	3242

DRUM BALL from IVAN MACKINTOSH

HERE is a simple Basic demo which bounces a little ball around the screen. It uses a modified display list and drum-type sound effects, both of which could be adapted for use in your own programs.

Line 10 sets up the program variables.

Line 20 sets up the modified display list, and prints out the title line.

Line 30 prints the ball – a [Control-T] character – and checks the X coordinate.

Line 40 checks the Y coordinate of the ball.

Line 50 makes the drum sound effect. Then it removes the ball from its old X,Y position, increments X and Y accordingly and loops back to line 30 to print the new ball and go through the loop again.

```
10 GRAPHICS 0:X=10:Y=10:OX=X:OY=Y:DX=1
:DY=1:POKE 752,1:D=PEEK(560)+256*PEEK(
561):POKE D+3,71:POSITION 6,0
20 ? "DRUMBALL":POKE D+6,6:FOR T=18 TO
 28:POKE D+T,6:NEXT T
30 POSITION X,Y:? "•":IF X<1 OR X>38 T
HEN DX=-DX:V=8
40 IF Y<2 OR Y>18 THEN DY=-DY:V=8
50 V=V-(V>0)*2:SOUND 0,X,8,V:X=X+DX:Y=
Y+DY:POSITION OX,OY:? " ":OX=X:OY=Y:GO
TO 30
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	19115	20	10305	30	9029
40	5886	50	15361		

DISC SECTOR DISPLAY from GARY CHEUNG

THIS is a very useful utility program for the budding programmer. It allows you to read a given disc sector and display the Ascii contents on the screen. Perhaps adventurers will find the odd use for this one, too?

Line 10 POKEs the machine code routine into the Page 6, and determines the first byte of screen RAM (which is then used in line 50).

Line 20 contains the DATA for the machine code sector-read routine.

LIne 30 inputs the sector number to be read (STR) and reads the data into Page 6 (just after the machine code routine). The printing routine also starts on this line.

Line 40 prints all of the printable characters. Printing CHR$(27) before each character allows the system to print out the control codes as well as the normal Ascii character set.

Line 50 displays the only unprintable character, CHR$(155) – the RETURN key symbol. This is done by inserting 219, the internal video code of the symbol, into the screen RAM at the current cursor position.

```
10 GRAPHICS 0:DIM B$(1):FOR I=0 TO 25:
READ BYTE:POKE 1536+I,BYTE:NEXT I:DL=P
EEK(88)+256*PEEK(89)
20 DATA 104,104,141,11,3,104,141,10,3,
104,141,5,3,104,141,4,3,169,82,141,2,3
,76,83,228,96
30 ? :? "SECTOR TO READ";:INPUT STR:X=
USR(1536,STR,1600):? :? "SECTOR ";STR:
? :FOR I=0 TO 7:POKE 85,5
40 FOR J=0 TO 15:B$=CHR$(PEEK(1600+I*1
6+J)):IF B$<>CHR$(155) THEN ? CHR$(27)
;B$;:NEXT J:? :NEXT I:GOTO 30
50 IF B$=CHR$(155) THEN C=PEEK(85):POK
E (DL+PEEK(84)*40+C),219:POKE 85,C+1:N
EXT J:? :NEXT I:GOTO 30
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	17560	20	12854	30	17945
40	17939	50	17461		

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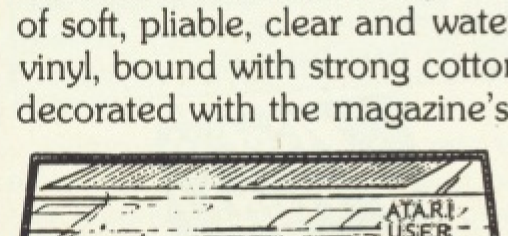
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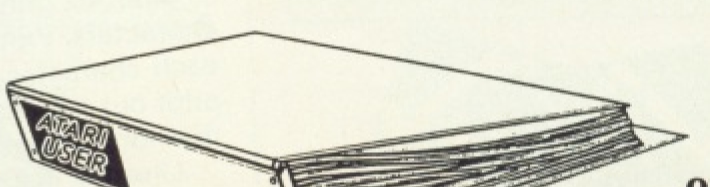
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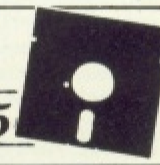
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AUGUST: Assembler: Make machine code programming easier. **Fruiti Gambler:** Save money with this fruit machine simulation. **Mandala:** Complex patterns made easy. **Protection:** Protect your programs from prying eyes. **Display List:** Demonstration programs. **Raider 1997:** Futuristic text adventure. **Touch Tablet:** Demonstration programs.

SEPTEMBER: Maze Munch: Help Horace the Blob munch the maze monsters' morsels. **Data Maker:** Convert your machine code routines to DATA statements. **Display List:** Demonstration programs. **Screen Dumps:** Dump your Mode 8 screens to a 1029 printer. **Bricks:** Solve the Bricks problem.

OCTOBER: Pontoon: Twist? Bust! **Memory Dump:** Examine memory in hex and Ascii. **Display List:** Demonstration programs. **Wrap Trap:** Action game for one or two players. **Computer Canvas:** Make your own micro masterpiece. **Assembler Update:** Improvements for RAW assembler. **Ram Disc:** Make the most of the 130XE's extra memory.

NOVEMBER: Guy Fawkes: Help Guy escape from the guards. **Converse:** Teach your Atari to be a psychotherapist. **Display List:** Demonstration programs. **Bitwise Operators:** Utility to provide logical functions. **Circle:** Draw and fill a circle. ***Plus:*** Freebie of the month – **Creepshow** machine code pinball game.

DECEMBER: Countdown: Micro version of the famous TV game. **Get It Right!:** Atari User's own check-sum program. **Disco:** Son et lumière on your Atari. **List Utility:** Makes listing easier. **Display List:** Demonstration programs. ***Plus:*** Freebie of the month – **Jane's Program** machine code entertainment.

JANUARY 1986: Bells: Help Mr Humpy rescue Esmerelda. **Get It Right!:** Atari User's own checksum program. **Alien Attack:** The game to accompany the machine code series. **Lister:** Make listing programs easy. **Dots:** Play the micro or another player at this strategy game. **Dump:** 1020 printer/plotter routine. ***Plus:*** Freebie of the month – **Scramble Fighter** machine code game.

BASIC COMPILER: The entire set of Basic Compiler programs from the March to June issues on one tape/disc. Write easy routines for your programs that will run at machine code speed. Contains the Compiler, Library and many example programs. (N.B. Requires an assembler.)

FEBRUARY: Micropainter: Programs to manipulate Micropainter screens. **Clock:** Interrupt driven clock utility. **Flasher:** Flashing colour utility. **Bounce!:** Simple to play, hard to master. **Bridge:** The thinking person's card game. ***Plus:*** Freebie of the month: **Demon's Lair** – an adventure game you may never escape from.

MARCH: Horse Play: Knight's tour program. **Basic Compiler:** Program to accompany the new series. **Alien Attack:** Final part of assembly listing. ***Plus:*** Freebie of the month: **Winston in the Caves** – can you keep your head and help Winston find his?

APRIL: Synthesiser: Activate the hidden depths of the Atari sound chip. **Disc index:** Keep track of disc files and free space with this index printing program. **Graphics:** Make the most of Modes 12 and 13. **Mancuna:** Can you beat the game that learns from its mistakes?

MAY: Cavern Escape: Can you help In-I-Go Joe escape from the labyrinths with King Muneebag's gold? **Player Missile:** Program to accompany the start of the series. **Spelling:** Automate those weekly school spelling tests.

JUNE: Maze Creator: Create hundreds of new mazes for last month's Cavern Escape game. **Player Missile Designer:** Create your own DATA shapes with this Player/Missile Editor. **Five Liner 1:** Simple Dice rolling routine – build it into your own programs.

JULY: Space Maze: Manoeuvre your space ship through the treacherous space caverns. **Player Missile Example:** Program to display your Player Missile graphics. **Gadgets:** Two programs to run devices via your new joystick-port interface. **Five Liner 2:** Create BBC-type displays on your Atari. **Rambas:** Correct those bugs in the XL's Rev. B Basic.

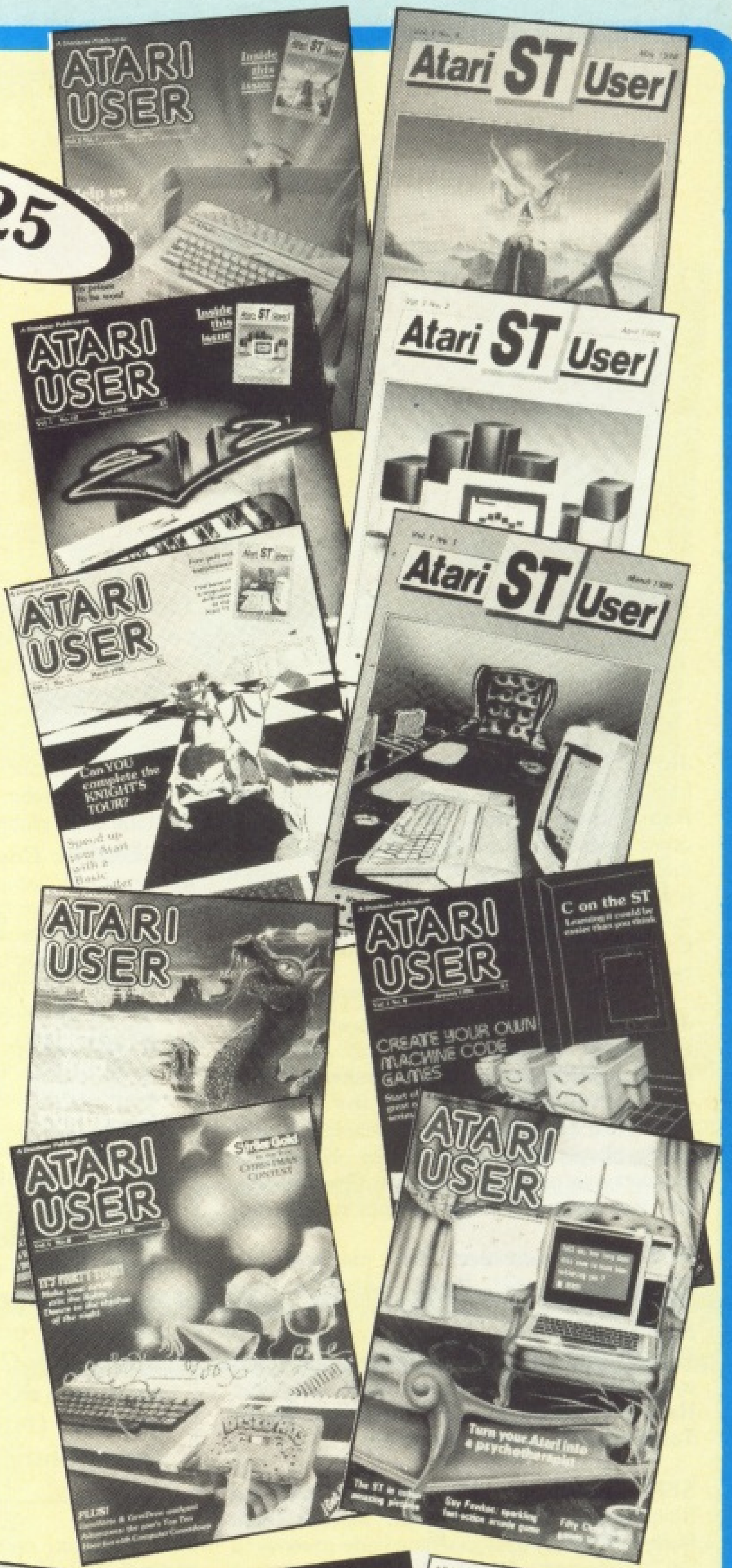
AUGUST: Frank the Fruit Fiend: Arcade Action in Basic and machine code. **80 Column Display:** Use 80 column displays on your 8 bit Atari. **Get It Right:** By popular demand, an updated version of our checksum program. **Player Missile Programs:** Three programs to move your PMGs vertically. **Five Liners:** More of our utilities in five lines.

SEPTEMBER: Fence Builder: High speed action game, **Player/Missile Programs:** Three programs demonstrating Player/Missile facilities. **Five Liners:** Five more programs to entertain and amaze. **Gadgets:** Four programs to test and run your mains control box.

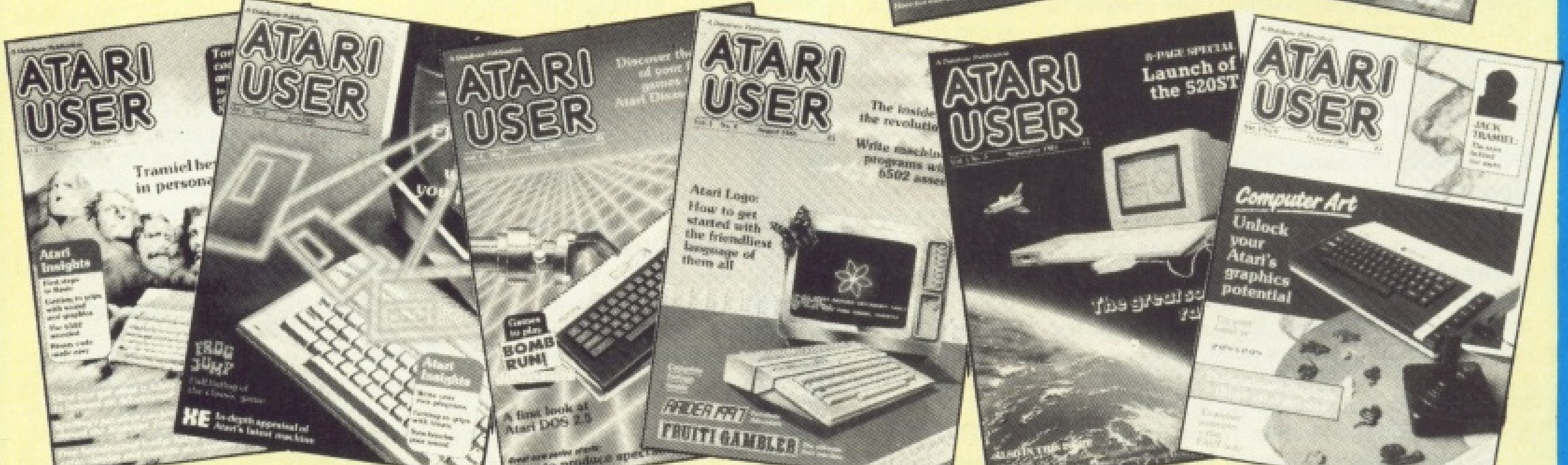
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